作成承認印	配布許可印
ニコン 映像カンパニー 品質保証部 GM	サービス 計画課 M

AF-S VR Nikkor ED 300mm f/2.8G IF

JAA33751

REPAIR MANUAL

Nikon | NIKON CORPORATION
Tokyo, Japan

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Printed in Japan January 2005

Specifications

Type of lens:	G-type AF-S Nikkor lens having built-in CPU and Nikon bayonet mount. Special vibration reduction (VR) mechanism incorporated
Focal length:	300mm
Maximum aperture:	f/2.8
Lens construction:	11 elements in 8 groups (3 ED glass and 2 Nano Crystal Coat-deposited lens elements), as well as 1 protective glass
Picture angle:	8 ° 10’ [5° 20’ with Nikon digital cameras (Nikon DX format); 6° 40’ with IX240 system cameras]
Distance information:	Output to camera body
Focusing:	Nikon Internal Focusing (IF) system (utilizing an internal Silent Wave Motor); manually via separate focus ring.
Vibration reduction:	Lens-shift method using voice coil motors (VCMs)
Shooting distance scale:	Graduated in meters and feel from 2.2 m (8 ft.) to infinity (∞)
Closest focusing distance:	2.3 m (7.5 ft) in AF mode, 2.2 m (7.2 ft.) in MF mode
Diaphragm:	Fully automatic
Aperture scale:	f/2.8 - f/22
Exposure measurement:	Via full-aperture method with cameras with CPU interface system
Focusing limit switch:	Provided; two ranges available:FULL （∞-2.3 m), or ∞-6 m
Tripod collar:	Rotatable through 360°, lens rotating position index at 90°, tripod collar only detachable
Dimensions:	Approx. 124 mm dia. x 267.5 mm extension from the camera's lens mounting flange
Weight:	Approx. 2870 g (6.3 lbs)

Specifications and design are subject to change without notice.

※ Before Disassembly / (Re)assembly / Adjustment

On this lens, the VR (vibration-reduction) unit is mounted to correct the picture blur.
In order to maintain the functional accuracy of the picture blur correction, if detaching the VR (vibration-reduction) unit and gyro base plate, be sure to adjust the VR by using the VR lens adjustment equipment (J15380）.
However, if disassembling the parts except the above, the VR adjustment is NOT necessary.

At service facilities where the "VR lens adjustment equipment" is not prepared, do NEITHER disassemble NOR repair the products of the above case.

Note:

① When disassembling, make sure to memorize the processing state of wires and FPC.
② Because prototypes are used for "Disassembly/(Re)assembly/Adjustment", they may differ from the actual products in forms, etc.
③ Because pictures are processed by a special method, they may differ from the actual ones in texture.

Points to notice for Lead-free solder products
・Lead-free solder is used for this product. ・For soldering work, the special solder and soldering iron are required. ・Do NOT mix up lead-free solder with traditional solder. ・Use the special soldering iron respectively for lead-free solder and lead solder. They cannot be used in common.

Disassembly

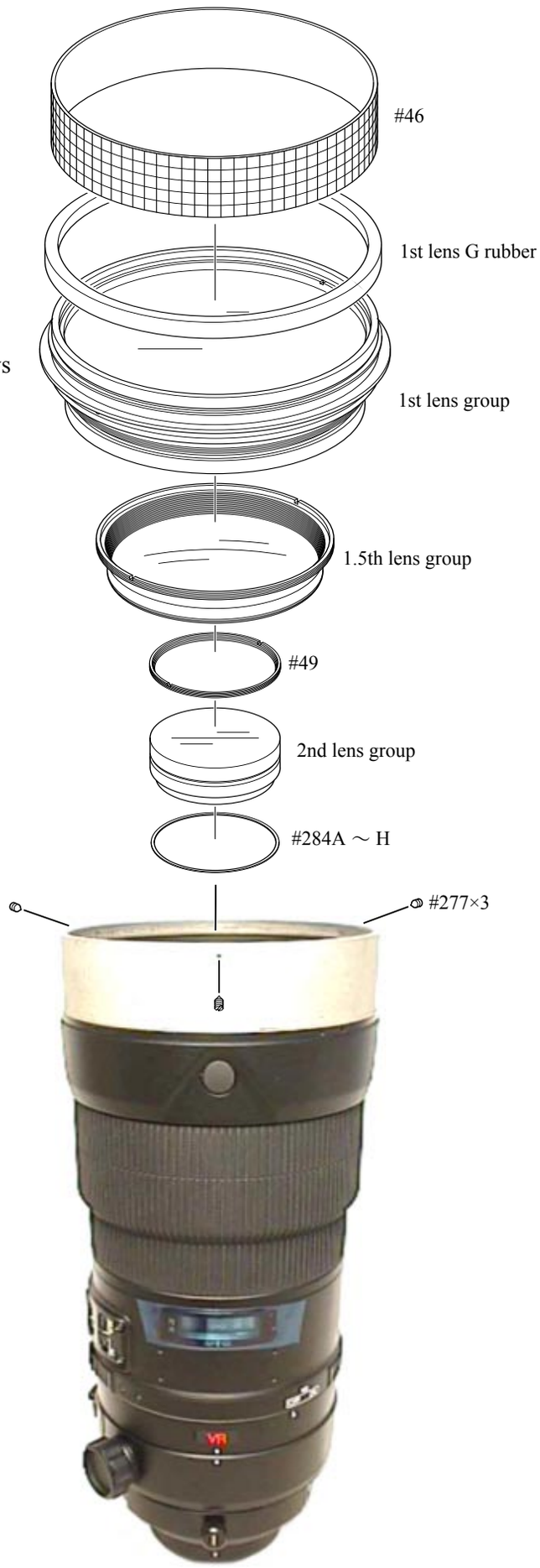
1st lens group, 1.5th lens group, 2nd lens group

① Remove the rubber ring (#46) and 3 setscrews (#277).

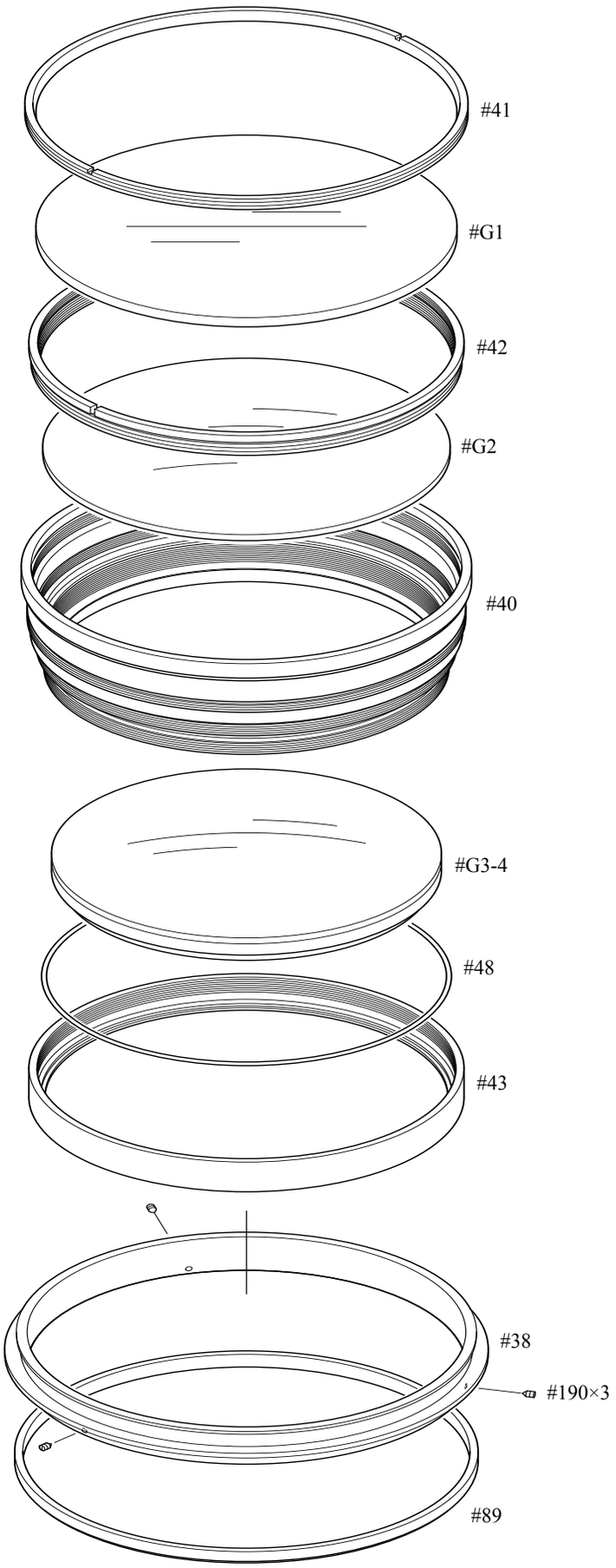
② Detach the 1st lens group.

③ Detach the 1.5th lens group with a wrench (J11288).

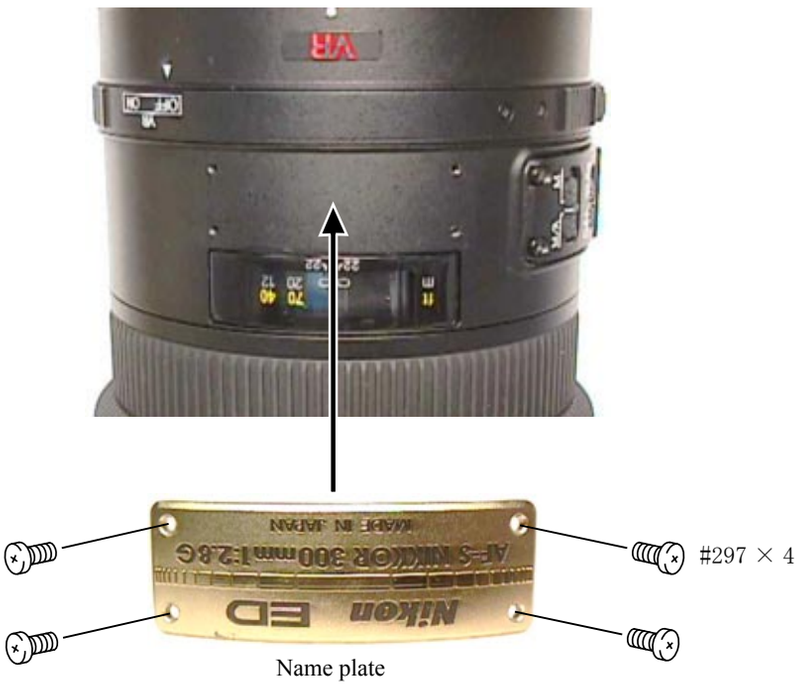
④ Remove the retaining ring (#49) with a wrench (J11290). Then detach the 2nd lens group and washers (#284A ～ H).



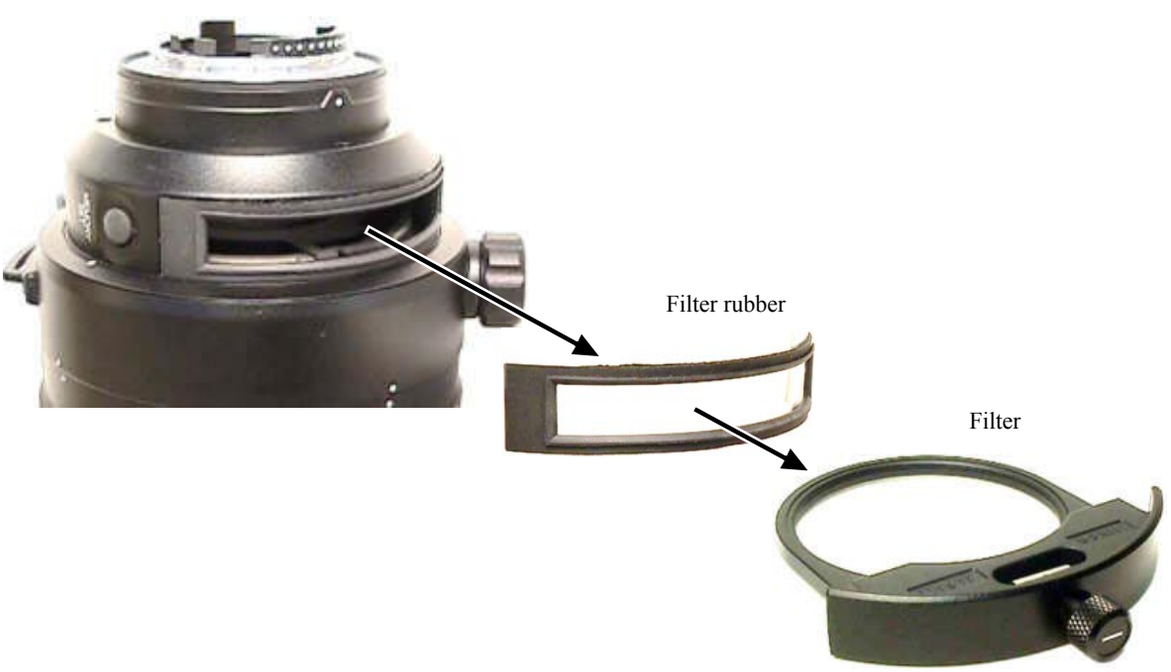
1st lens group



Name plate

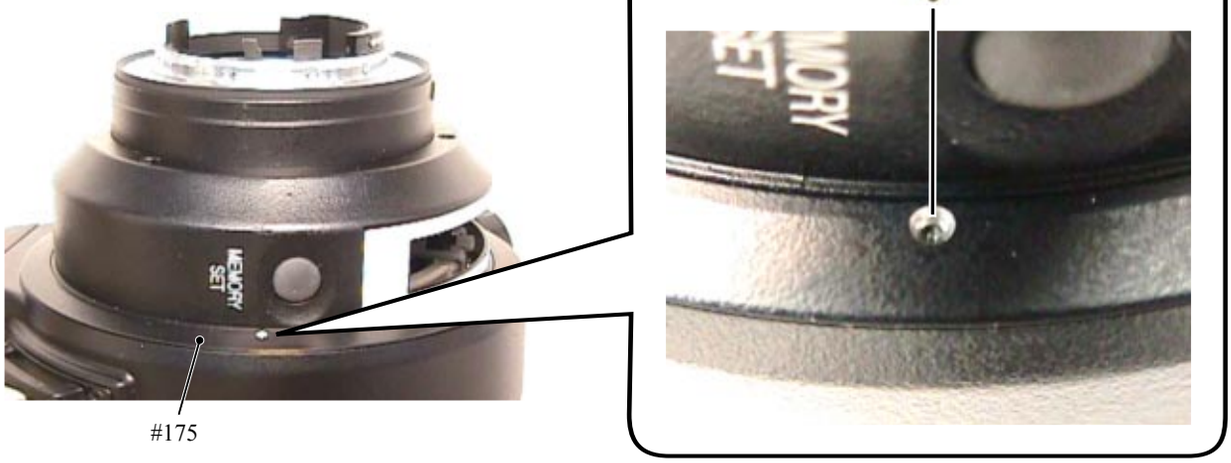


Filter, Filter rubber

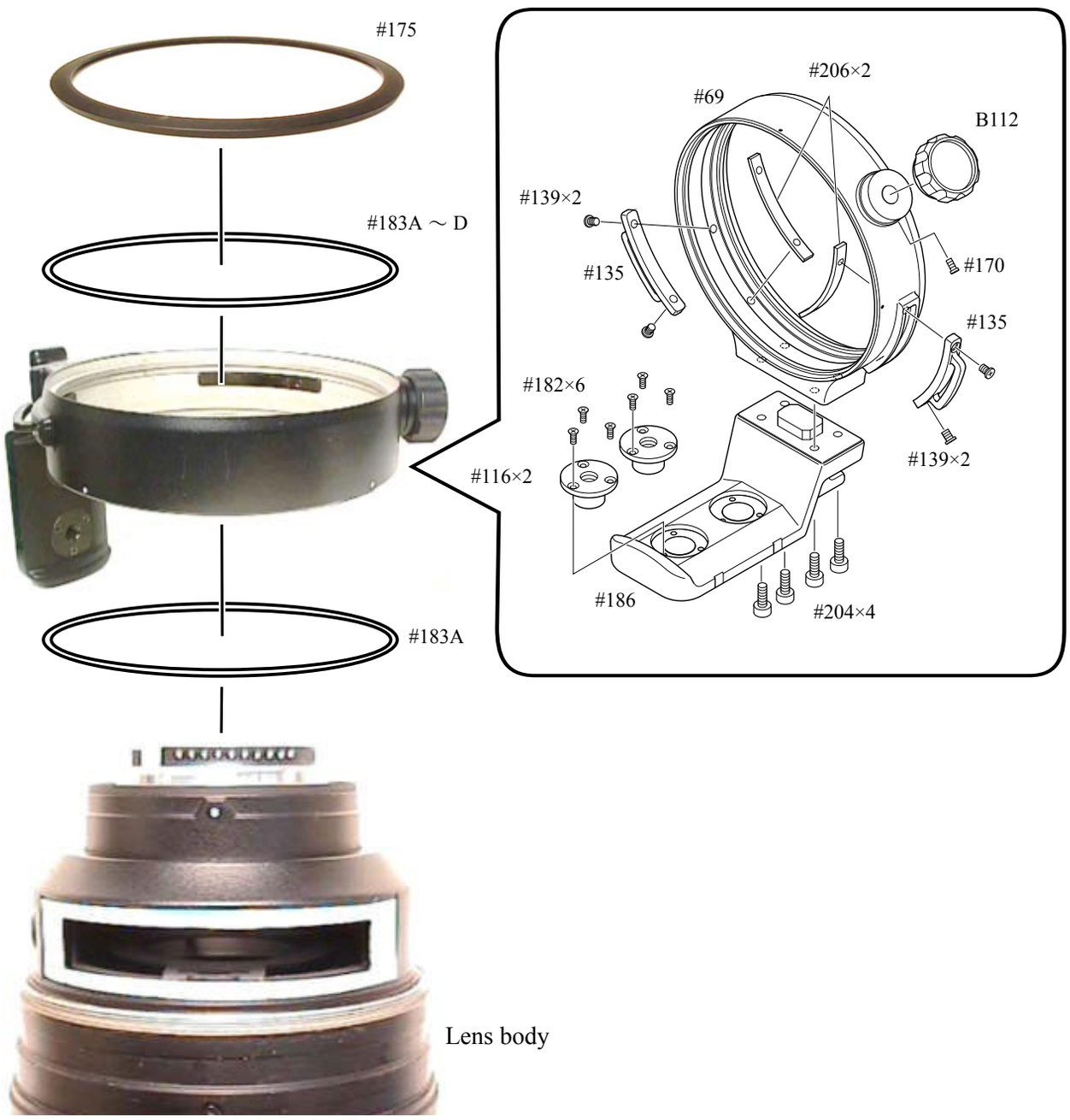


Tripod screw mount ring

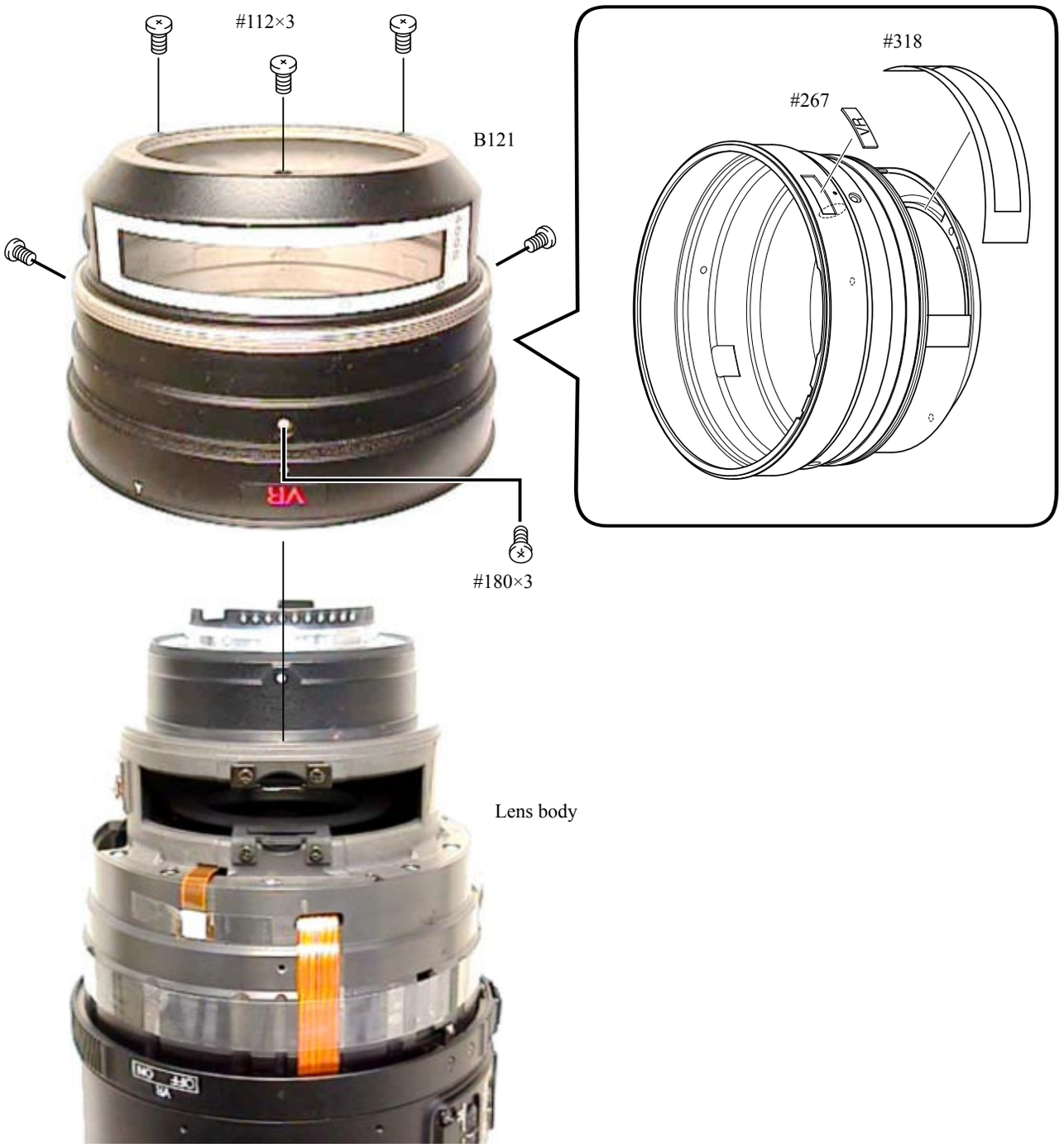
・ Take out the screw (#278) from the tripod retaining ring (#175).



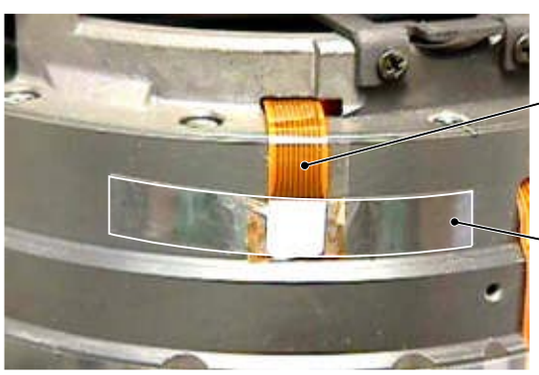
・ Disassemble the tripod screw mount ring.



External fixed tube unit

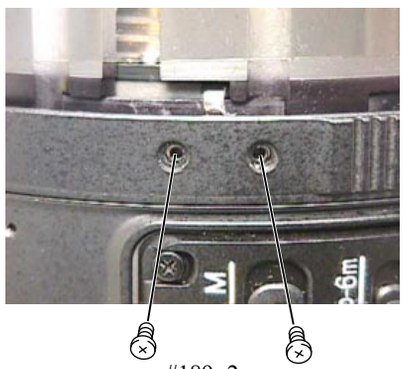


・ Remove the polyester tape.

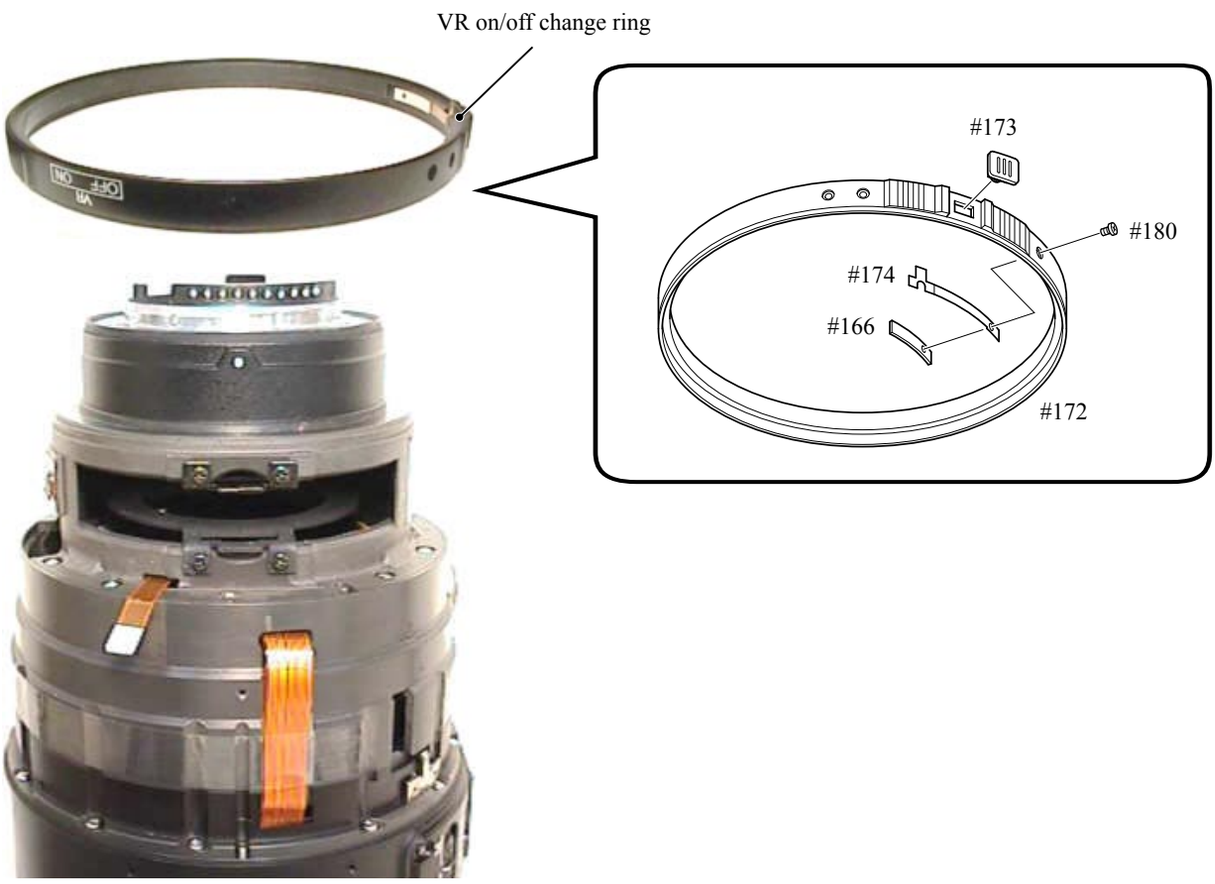


VR on/off change ring

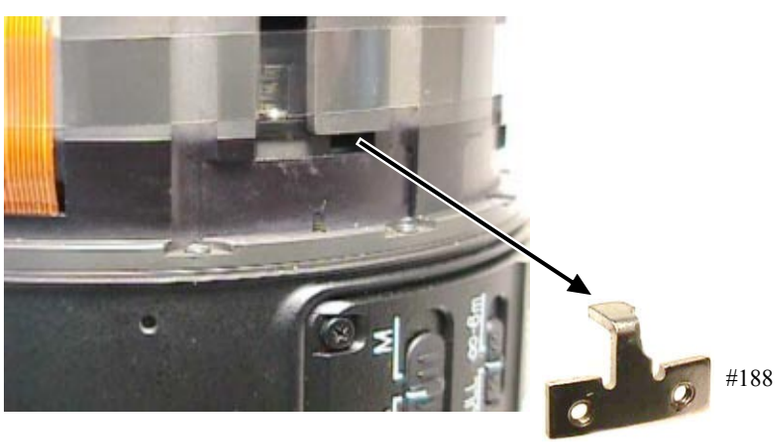
・ Take out 2 screws (#189) from the VR on/off change ring.



・ Disassemble the VR on/off change ring.



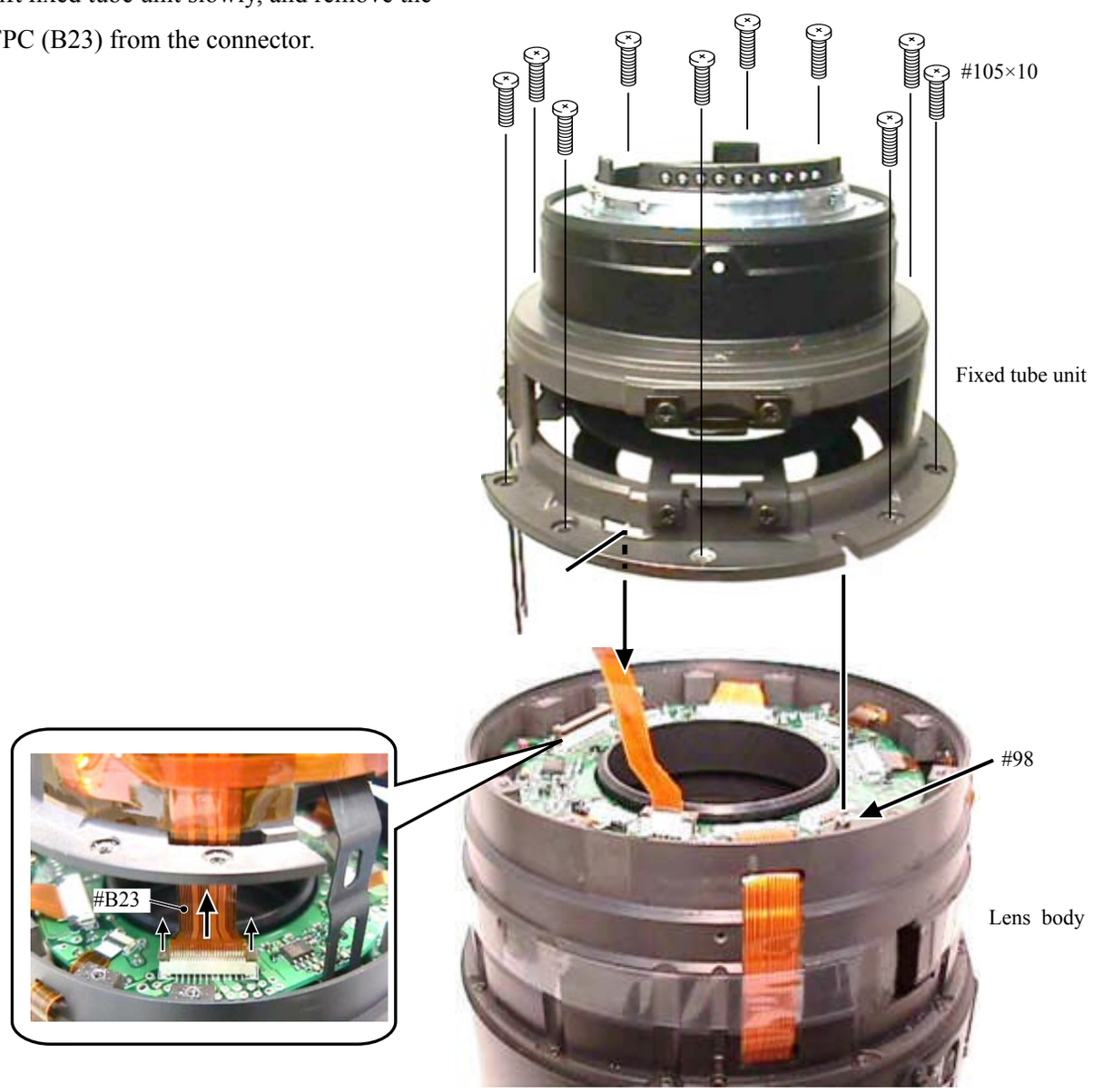
・ Take out the lock-ring connecting key (#188) from the hole of the VR unit.



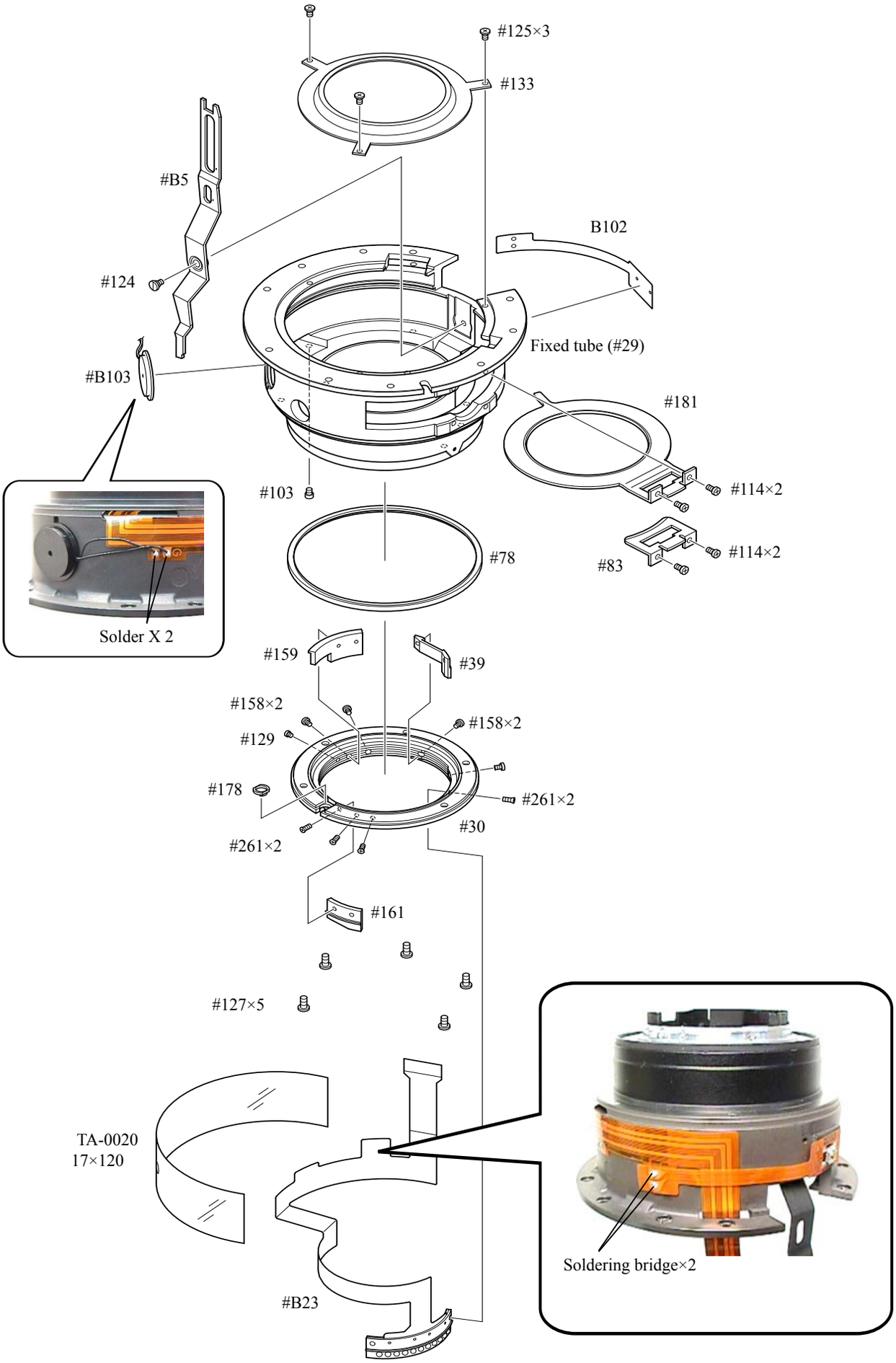
Fixed tube unit

① Take out 10 screws (#105) from the fixed tube unit.

② Lift fixed tube unit slowly, and remove the FPC (B23) from the connector.

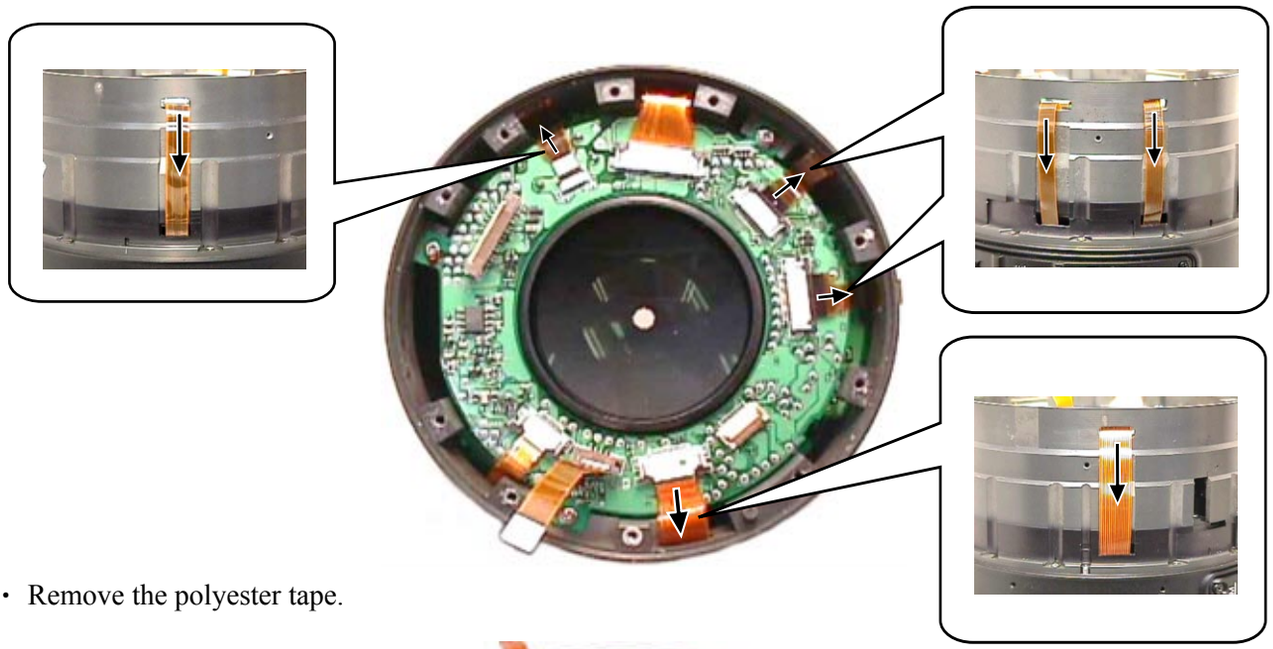


Disassemble Fixed tube unit

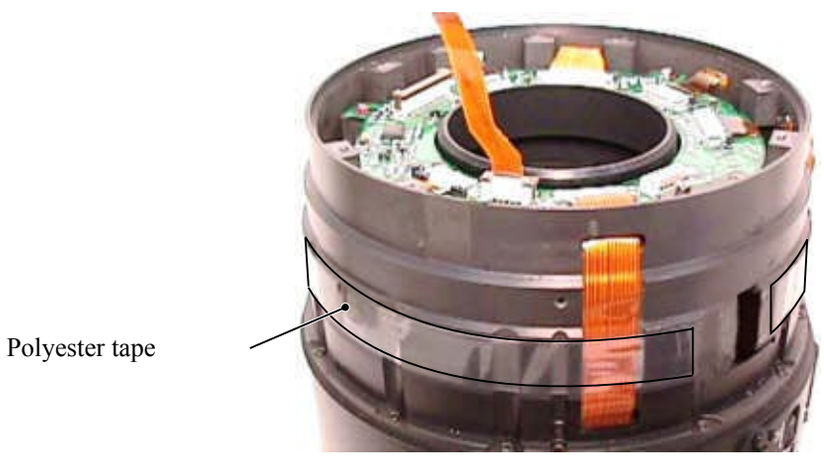


VR unit

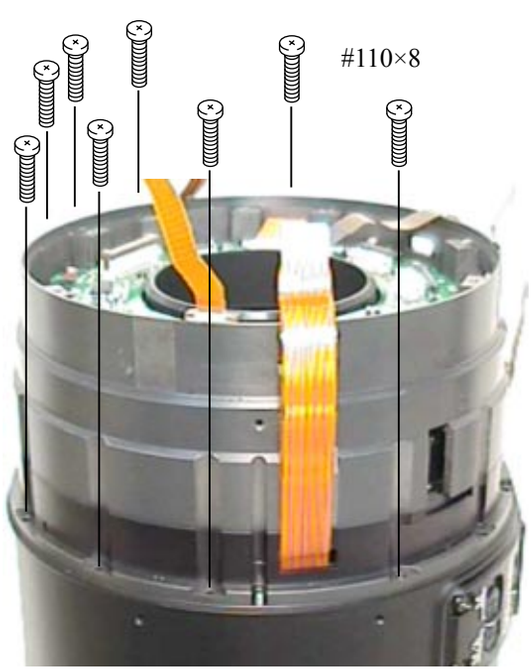
・ Remove the FPCs from each connector of the main PCB unit.



・ Remove the polyester tape.

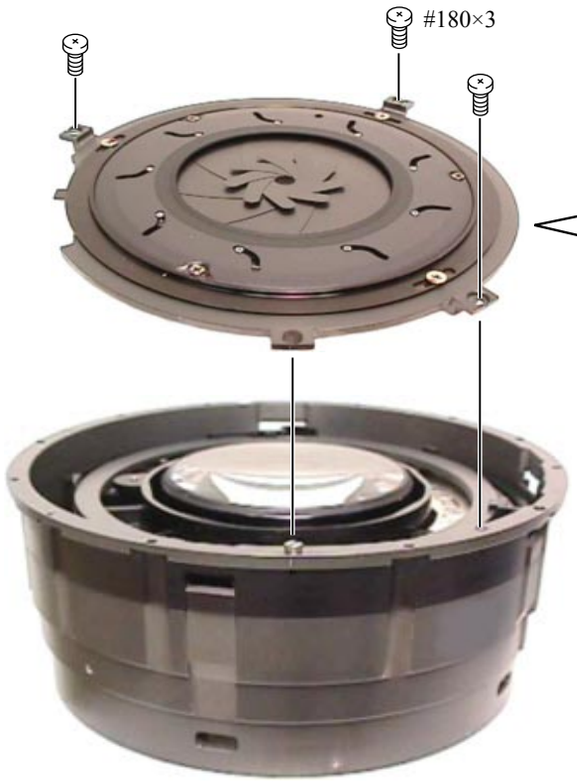


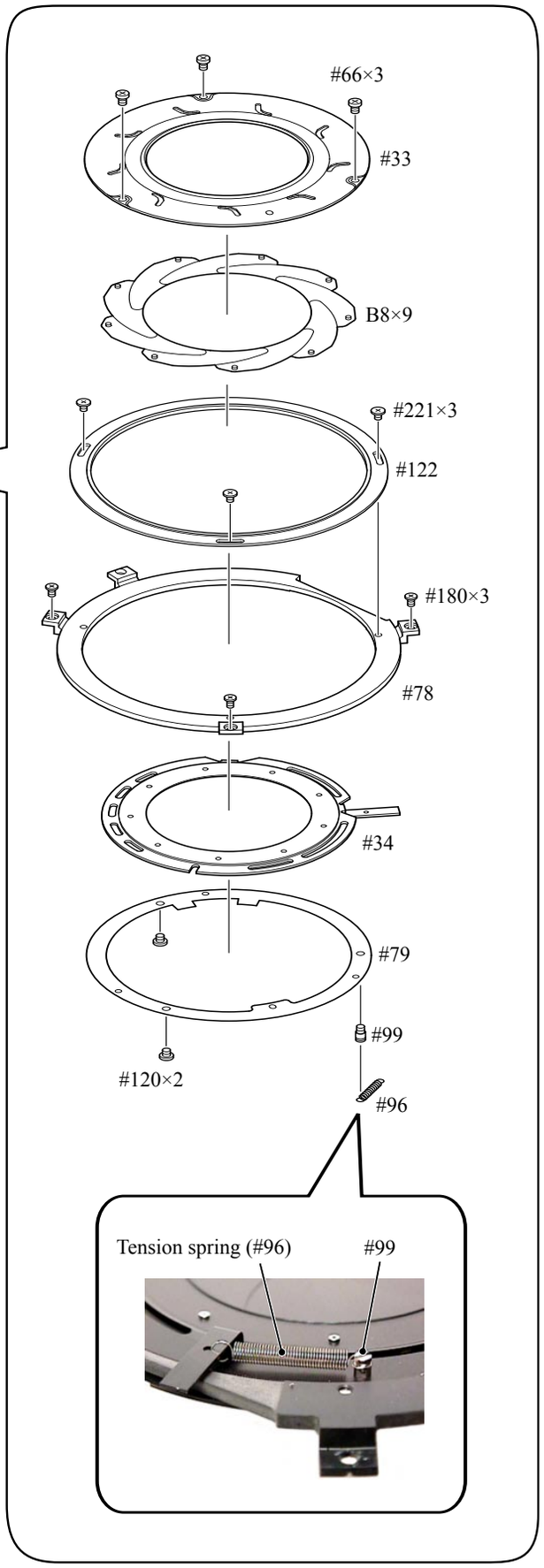
・ Take out 8 screws (#110) and 4 screws (#106). Then remove the VR unit while being careful of each FPC.



Aperture blade

・Take out 3 screws (#180) to remove the aperture blade unit.





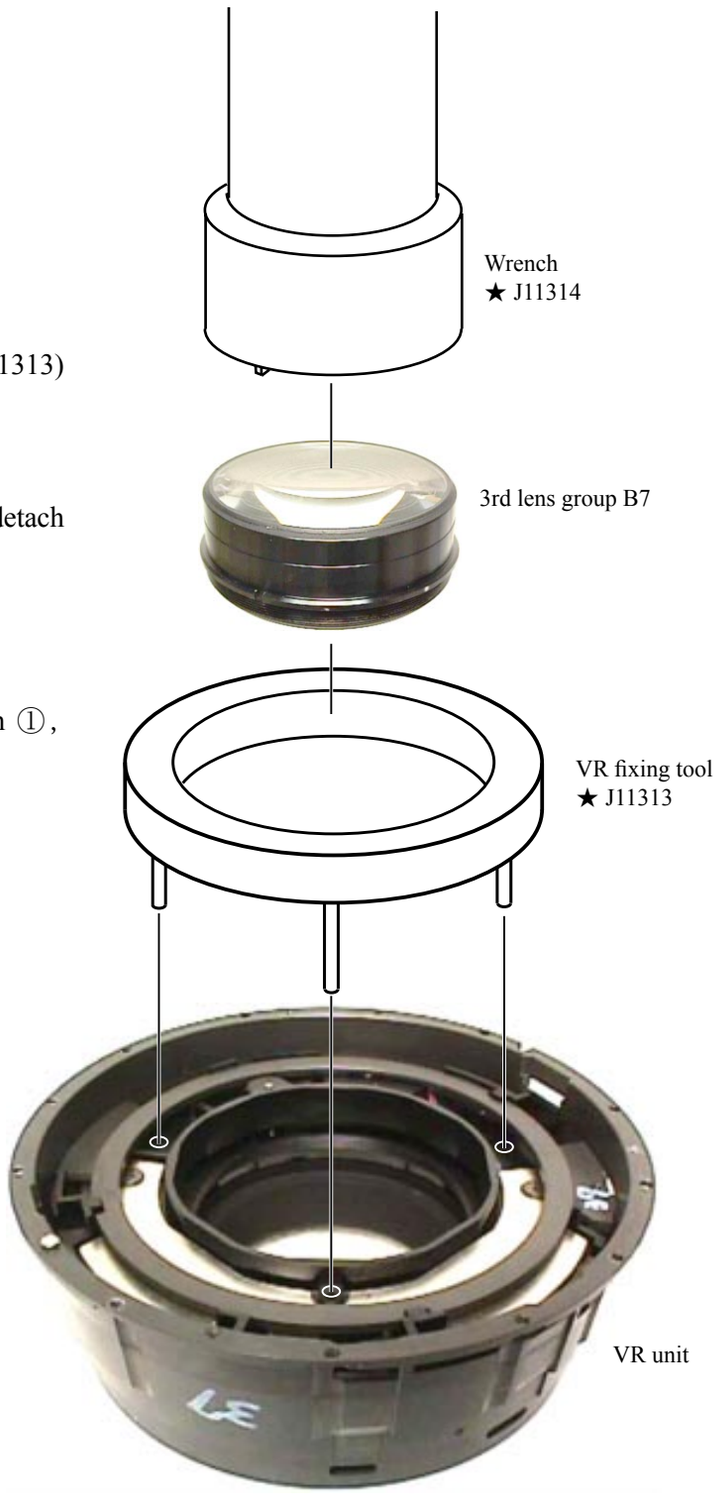
3rd lens group

★ : NEWTOOL

① Fit the VR fixing tool (★ J11313) in the VR fixed tube unit.

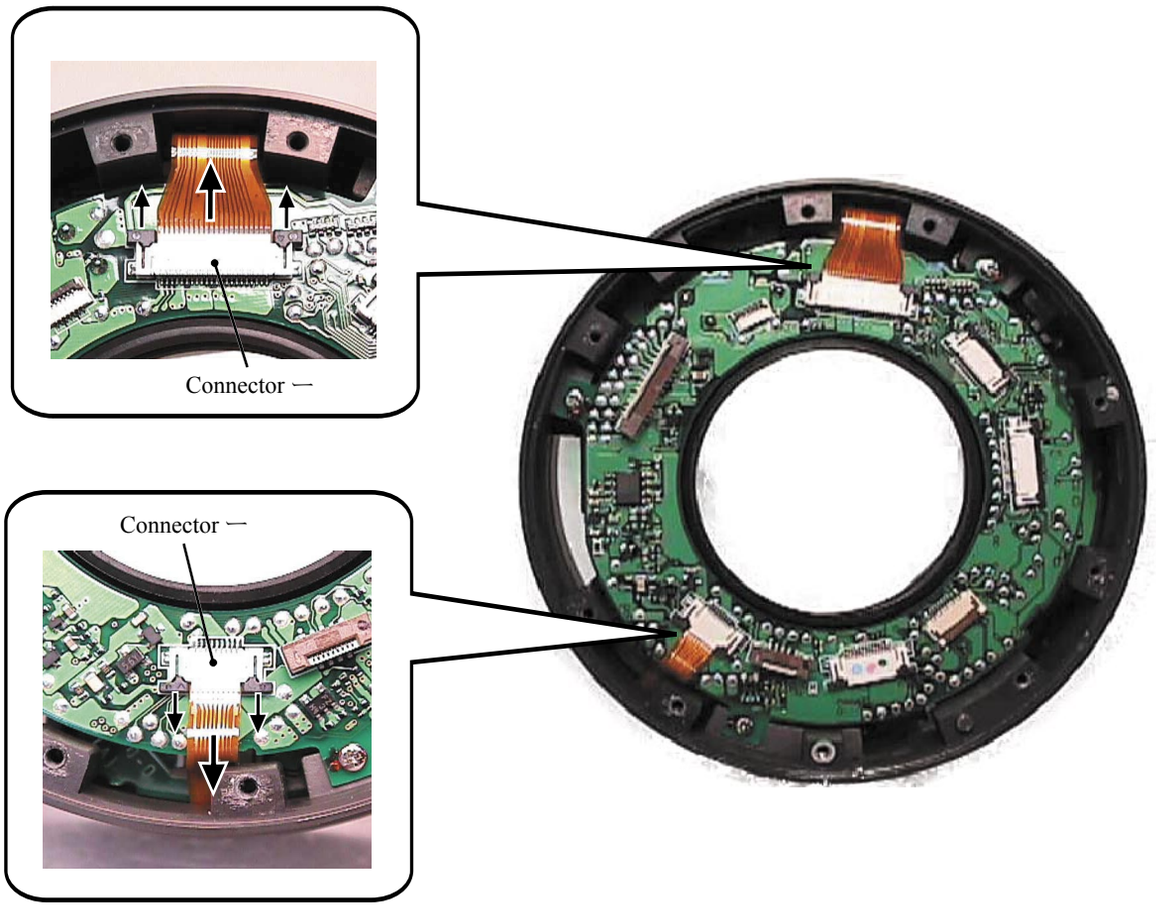
② With a wrench (★ J11314), detach the 3rd lens group (B7).

③ Remove the VR fixing tool (★ J11313), which was fit in ①, from the VR fixed tube unit.

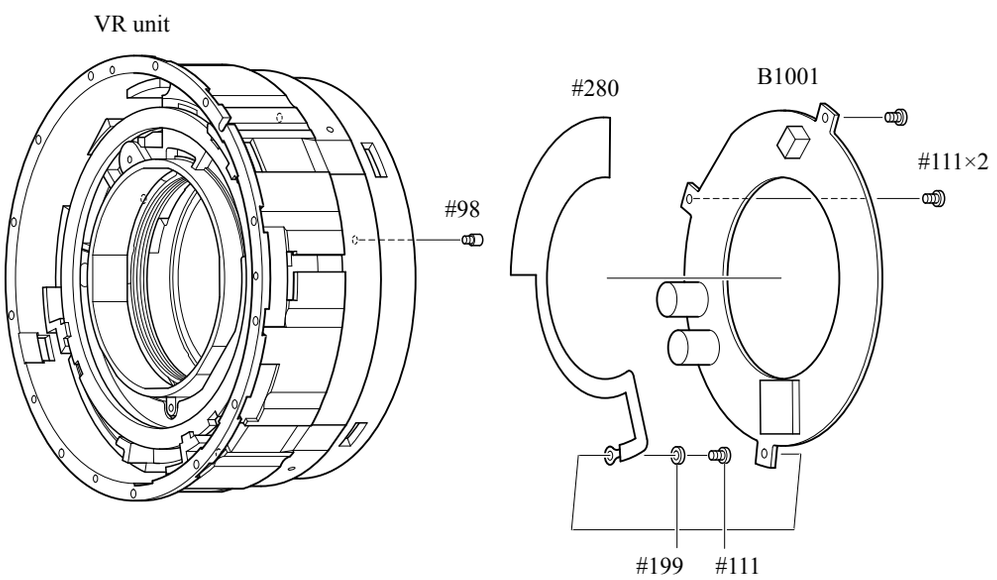


Main PCB unit

・ Remove the FPCs from the connectors of the VR unit.

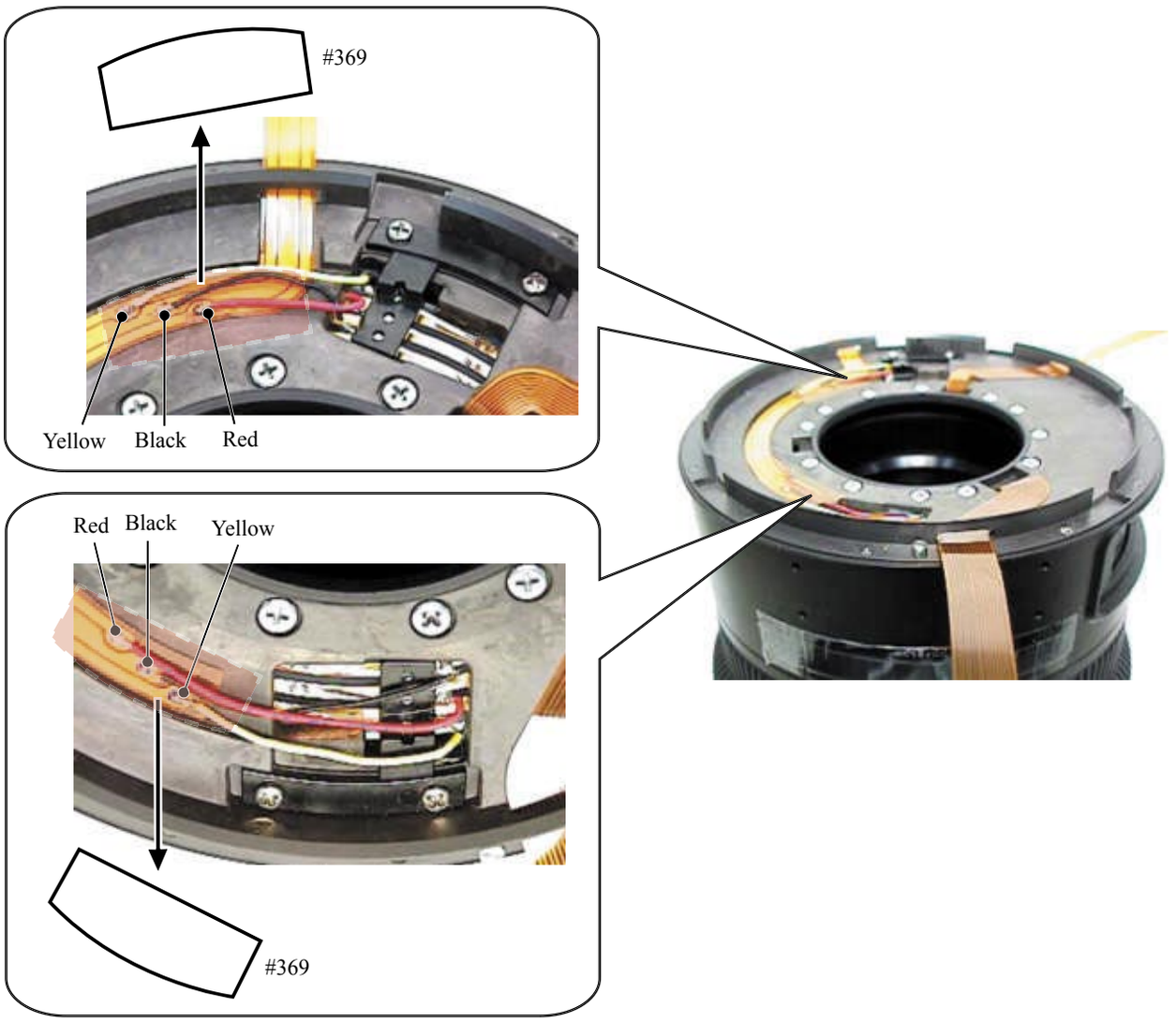


・ Take out 3 screws (#111) and the washer (#199). Then remove the main PCB unit (B1001) and shield (#280) from the VR unit.

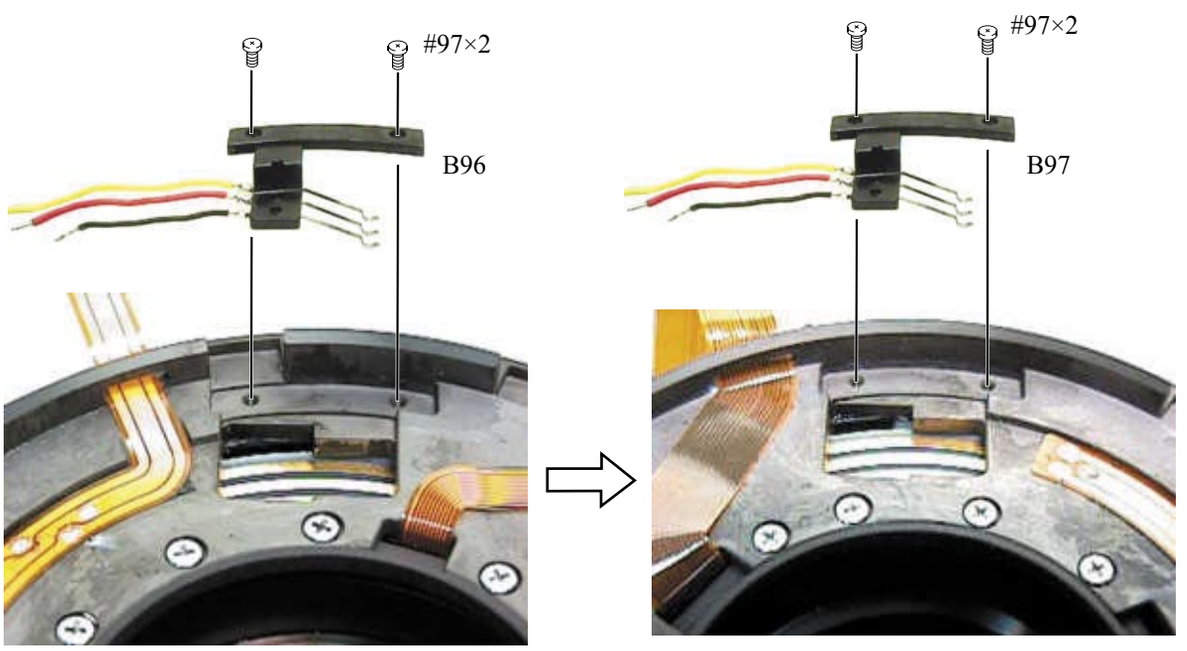


Power brush unit 1&2

・ Remove each wire.

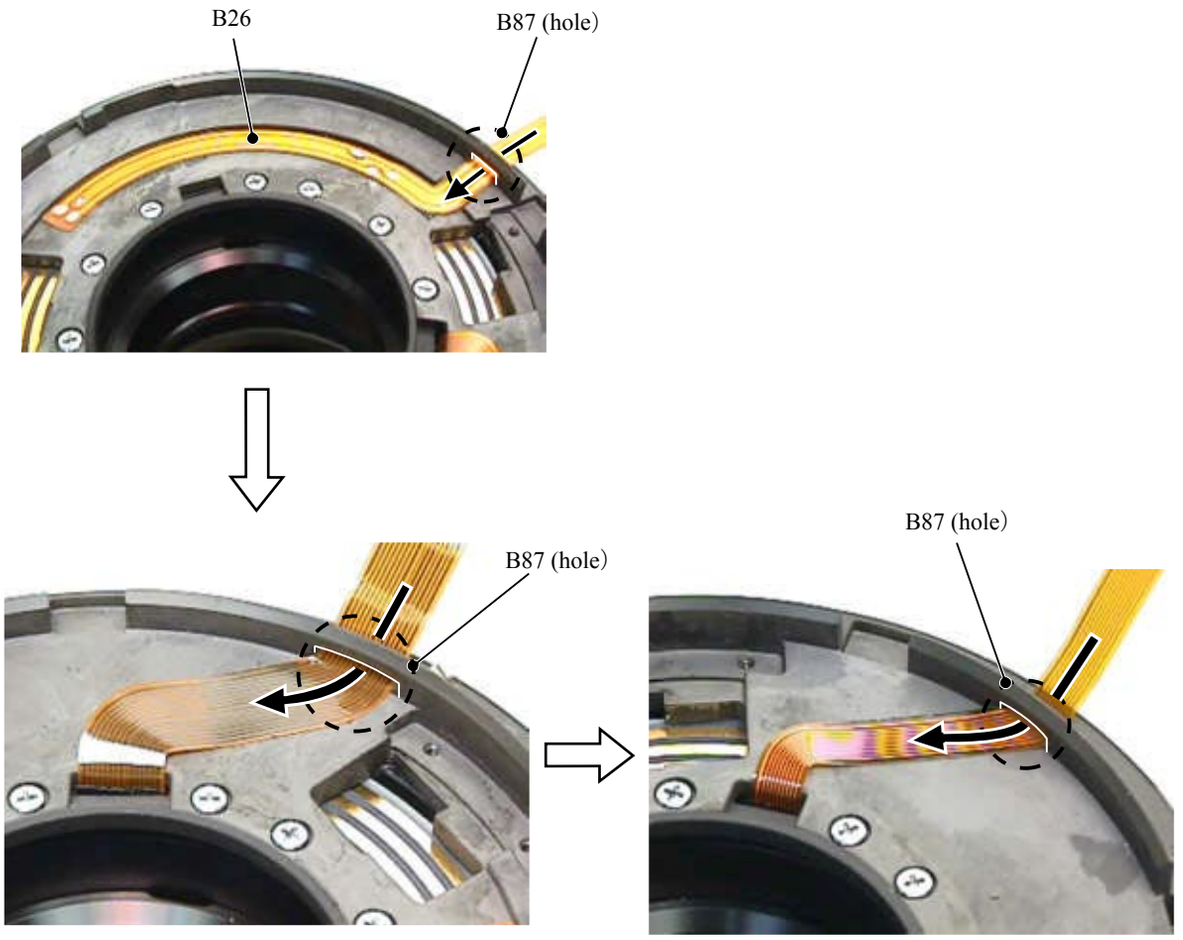


・ Remove the power brush unit 1(B96) and 2 (B97).

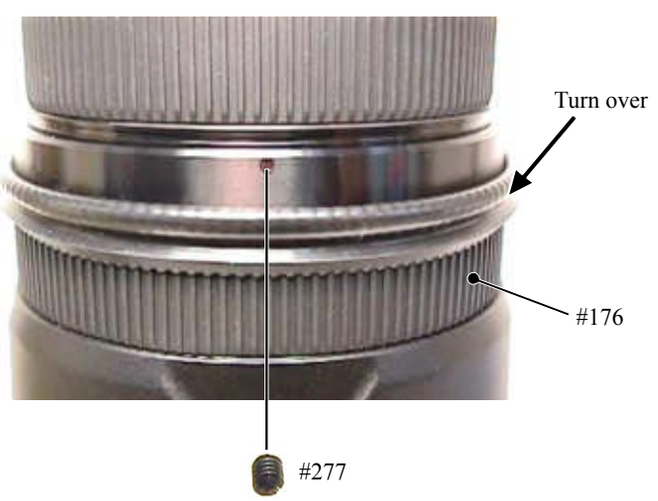


SWM power FPC unit

・ Take out the SWM power FPC unit (B26) from the hole of the SWM fixed tube unit (B87).

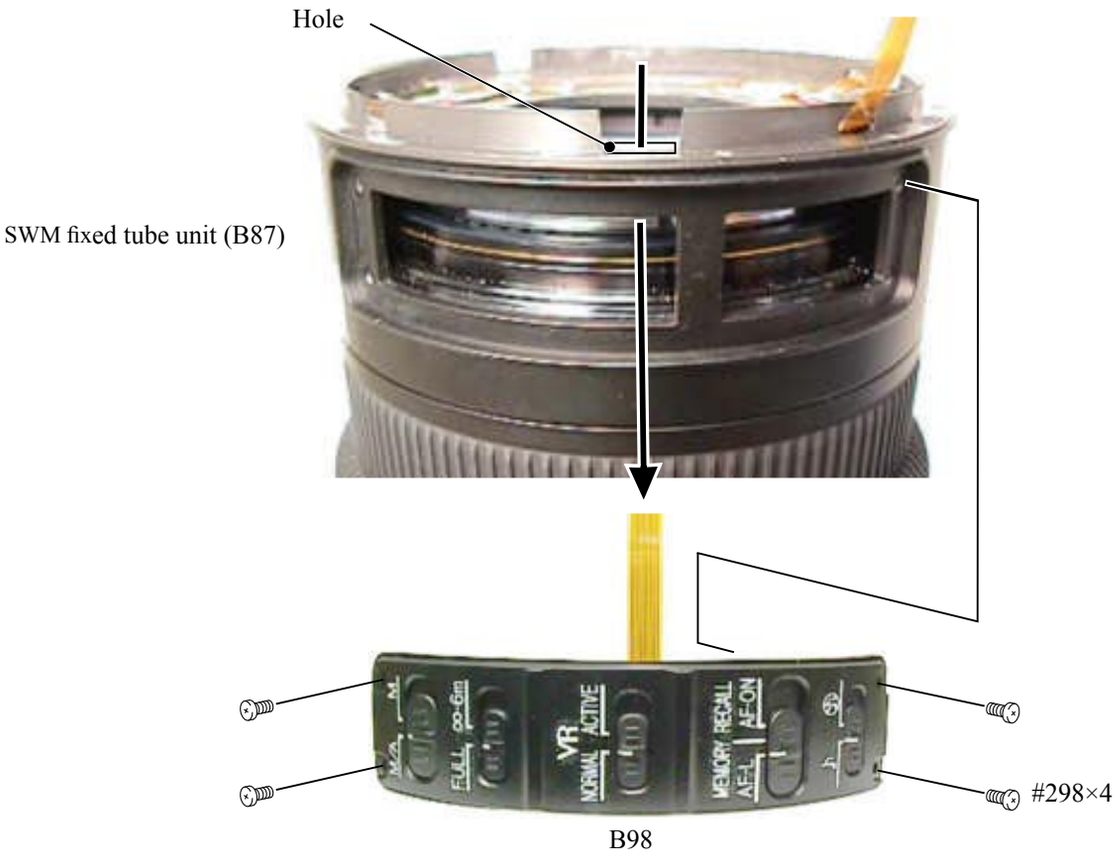


・ Turn over the rubber ring (#176) to take out the setscrew (#277).



Change SW unit

- Take out 4 screws (#298). While pulling the FPC, remove the change SW unit (B98).

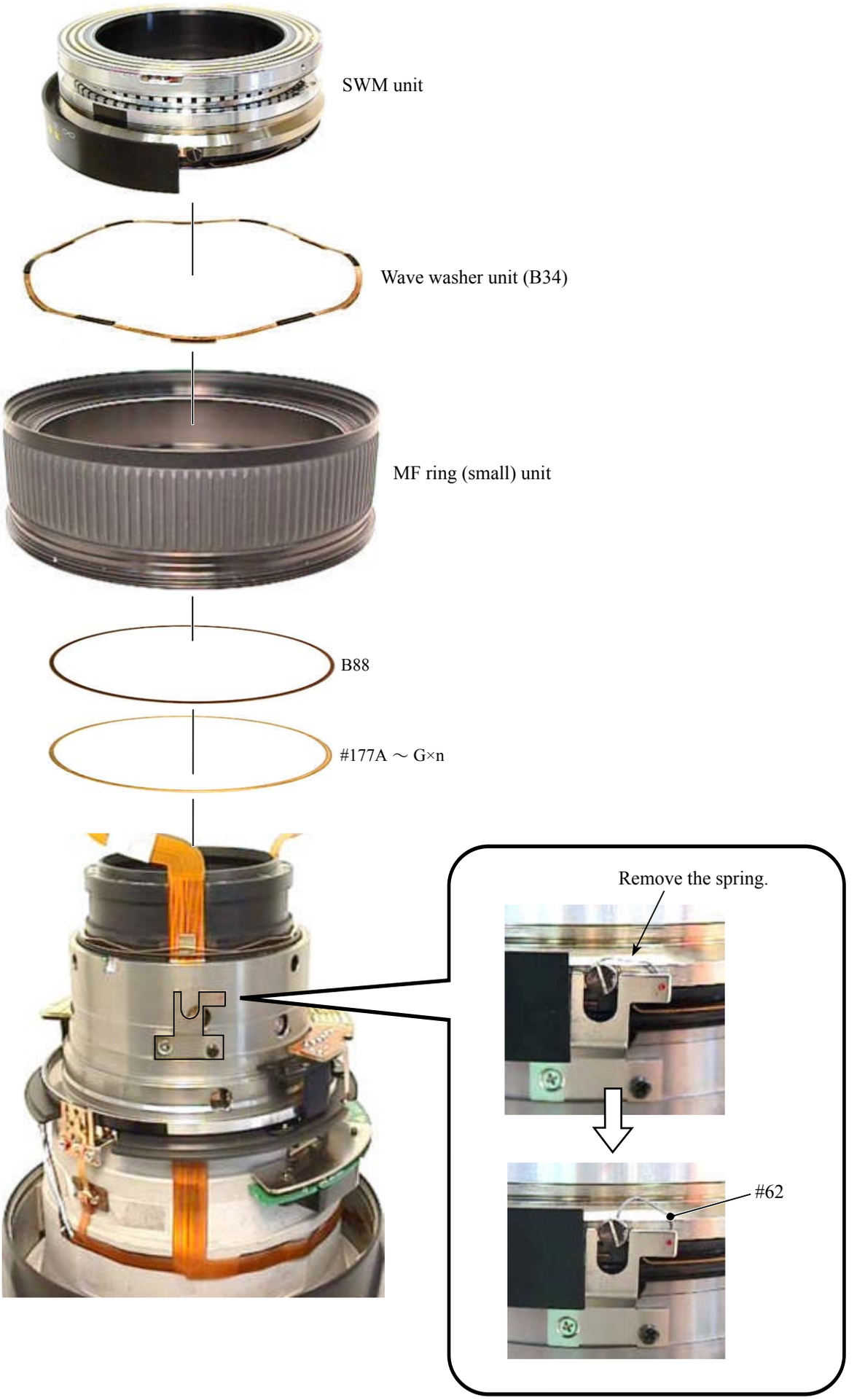


SWM fixed tube unit

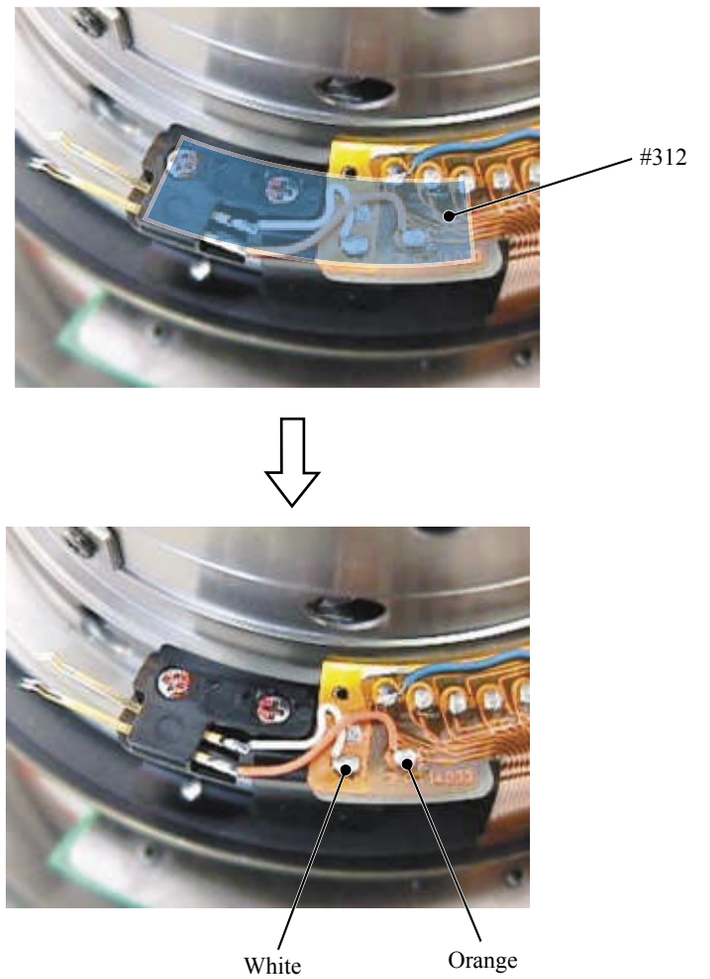
・ Remove the 3 guide rollers (#108) from the SWM unit.

Transparent ring unit, MR ring (large)

SWM unit

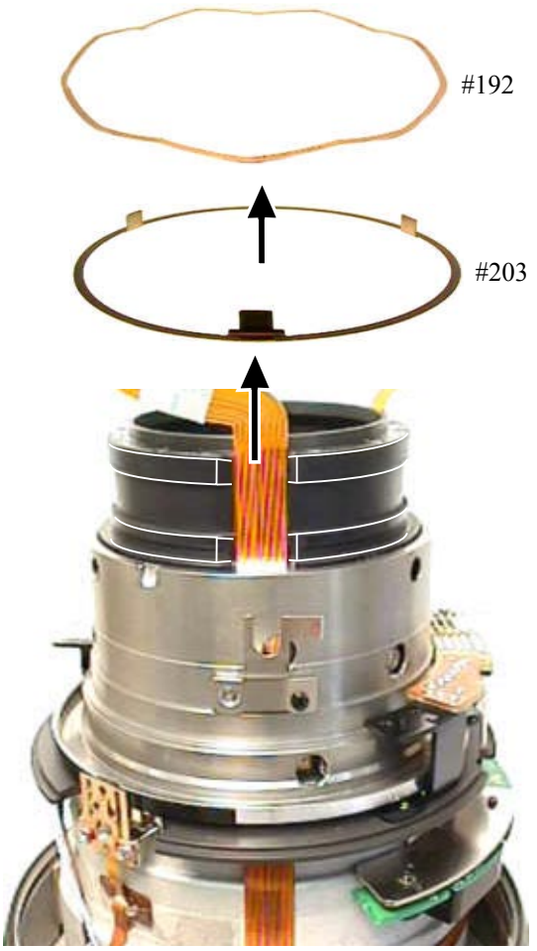

SWM unit
Wave washer unit (B34)
MF ring (small) unit
B88
#177A ～ G×n
Remove the spring.
#62

(MF rotation detecting) brush unit



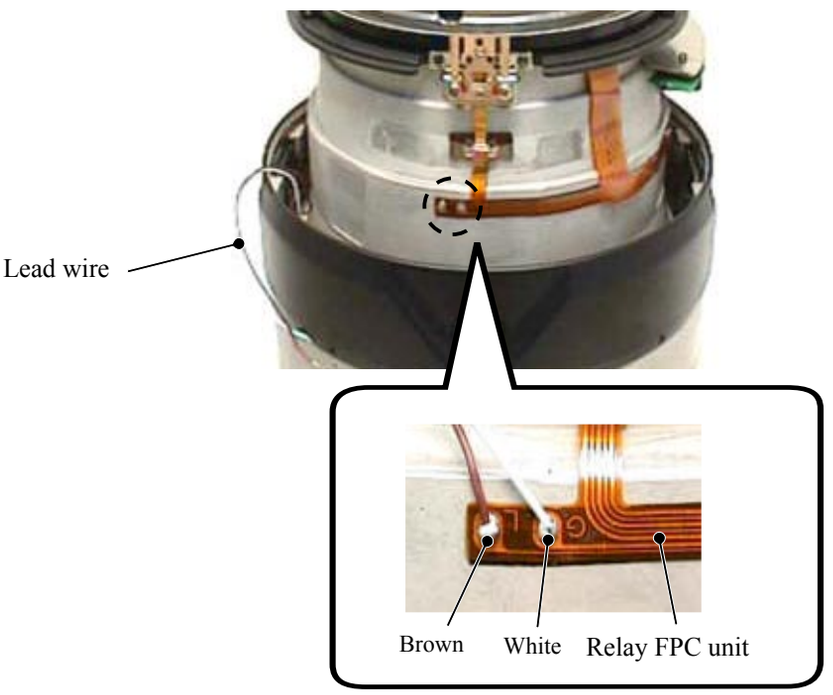
Wave washer, FPC retainer

・ Remove the wave washer (#192) and FPC retainer (#203) from the fixed tube unit.



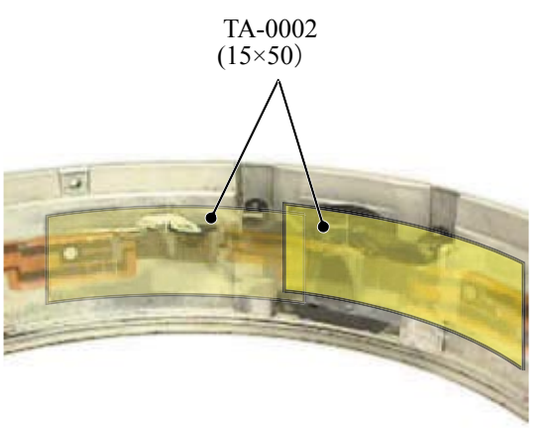
AF lock ring

① Remove the lead wire (FL-FPC) from the relay FPC unit.

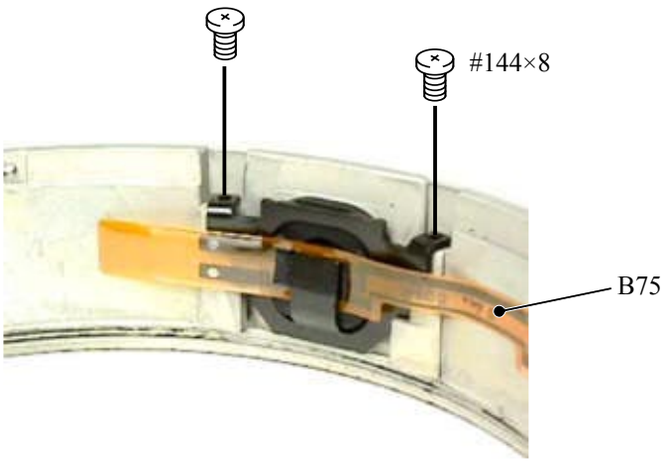


② Detach the AF lock ring from the front fixed tube by taking out 4 setscrews (#67).

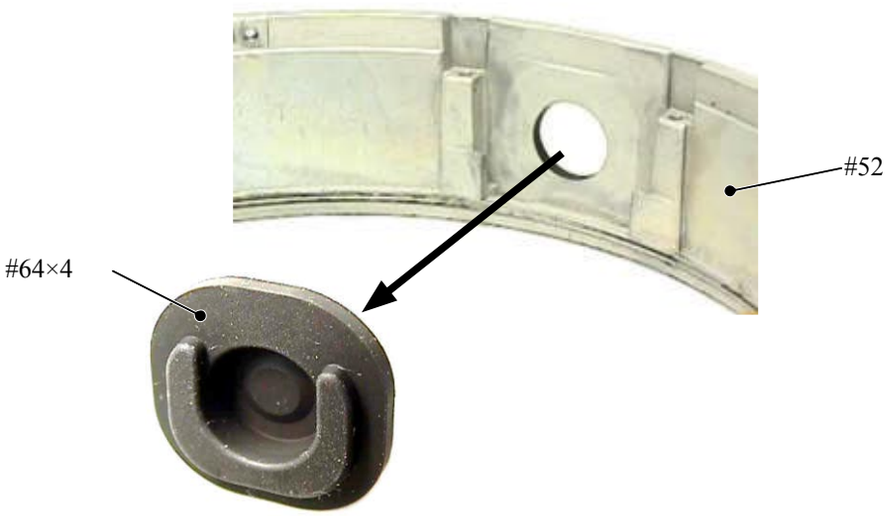
③ Remove the polyester film.



④ Detach the AF lock FPC unit (B75) from AF lock ring (#52) by taking out 8 screws (#114).

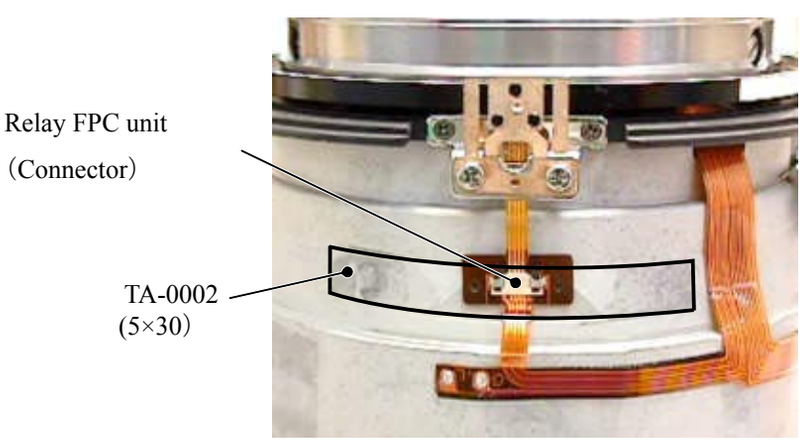


⑤ Remove 4 AF lock rubbers (#64) from the AF lock ring (#52).

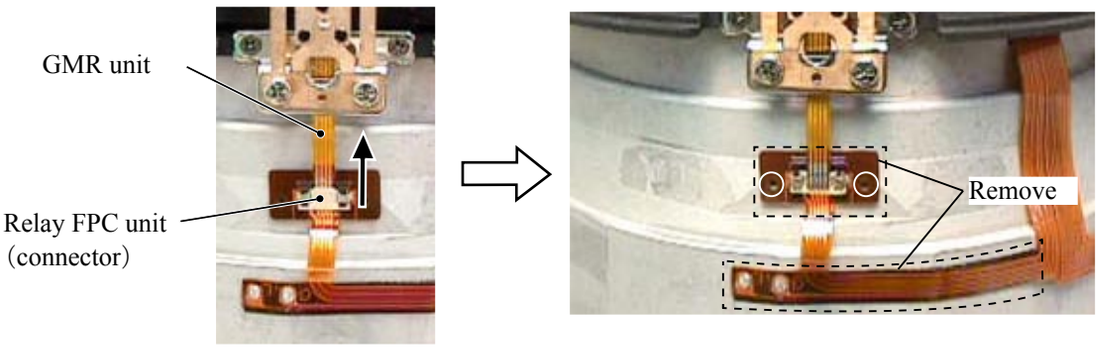


GMR unit

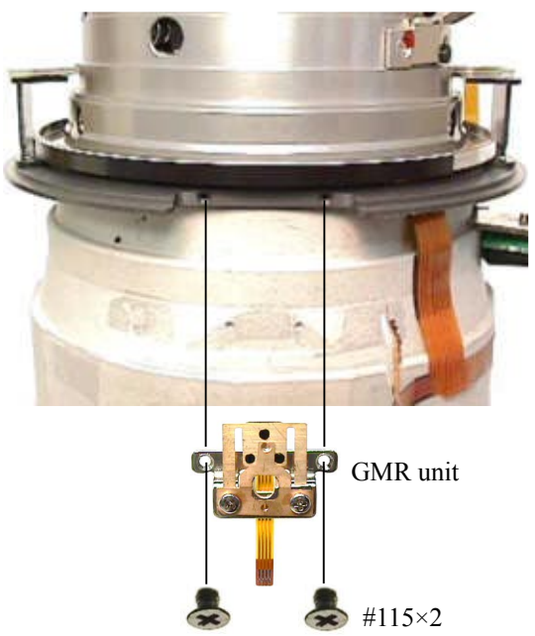
① Remove the tape [TA-0002(5×30)] from the relay FPC unit (connector).



② Remove the FPC of GMR unit from the relay FPC unit (connector).

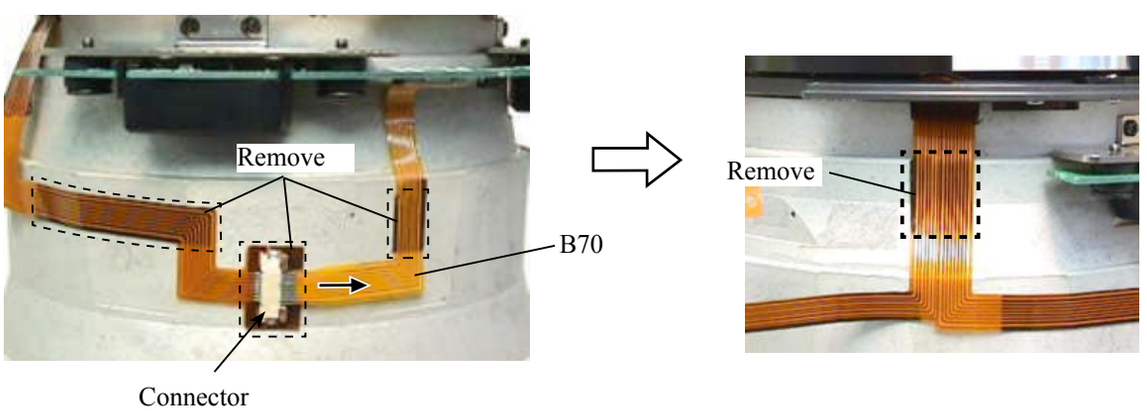


③ Take out 2 screws (#115), and remove the GMR unit from the fixed tube unit.

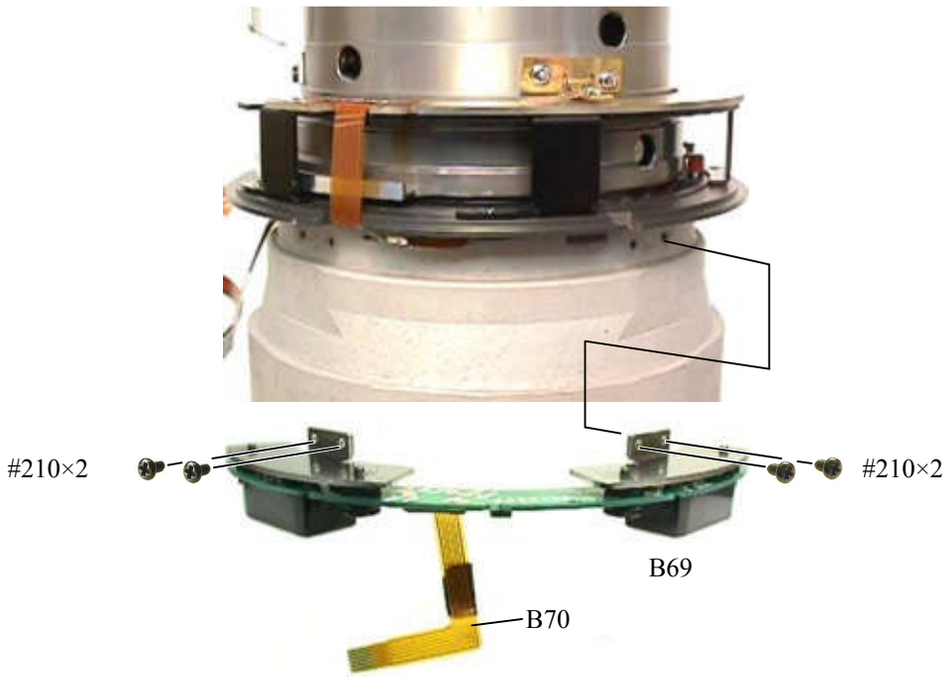


Gyro-relay FPC unit

・ Remove the gyro-relay FPC unit (B70) from the connector of the fixed tube unit, then remove the FPC.



Gyro unit

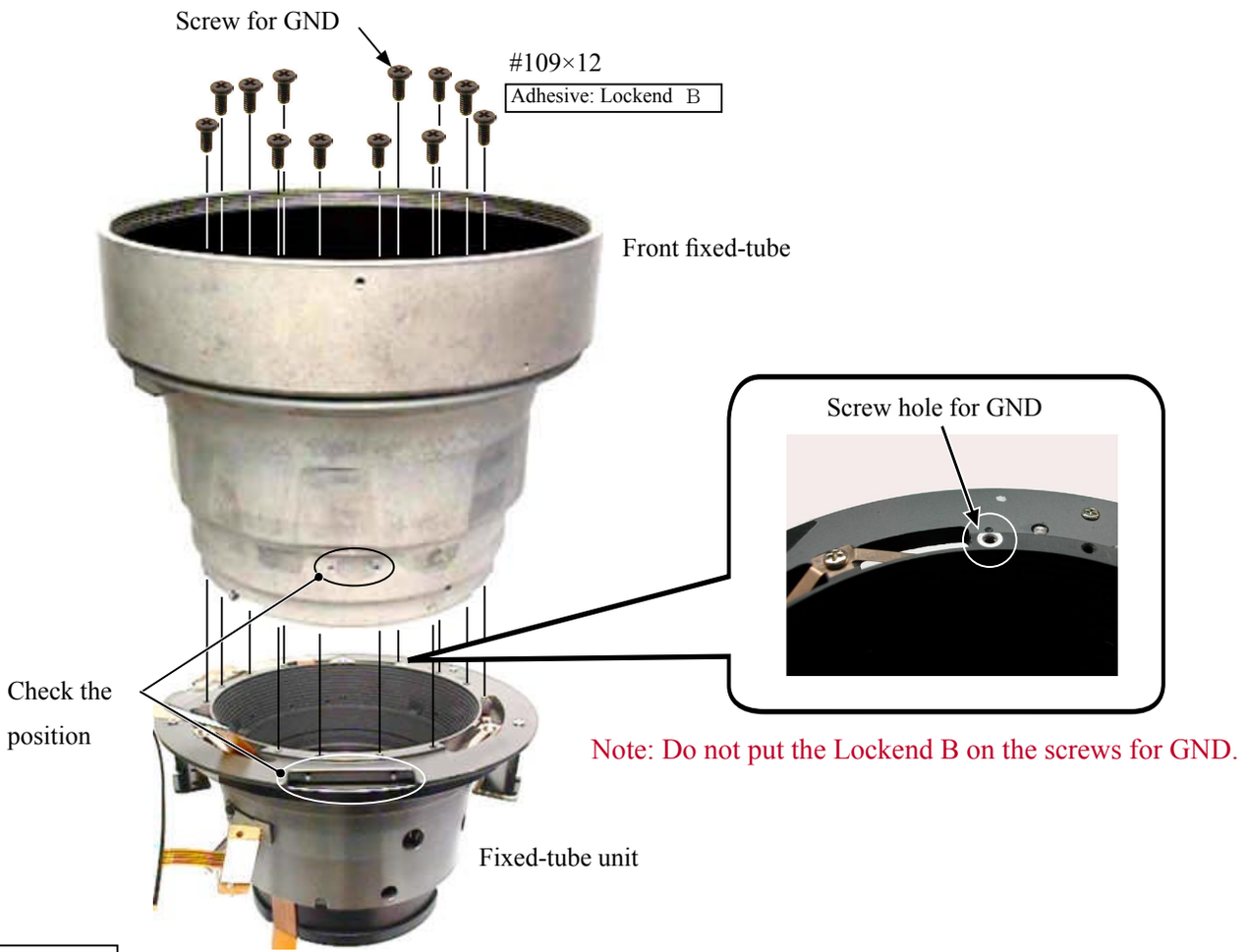


Front fixed tube unit

2. Assembly, Adjustment

Front fixed-tube unit

・Assemble the front fixed-tube into the fixed-tube unit.

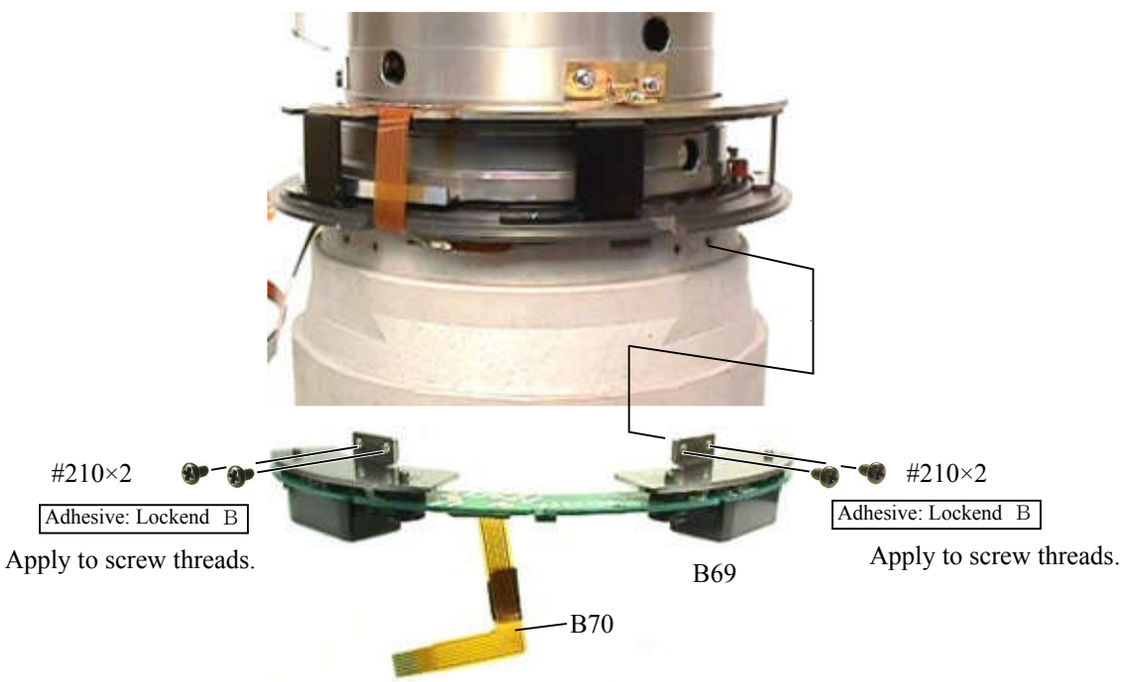


Note: Do not put the Lockend B on the screws for GND.

Gyro unit

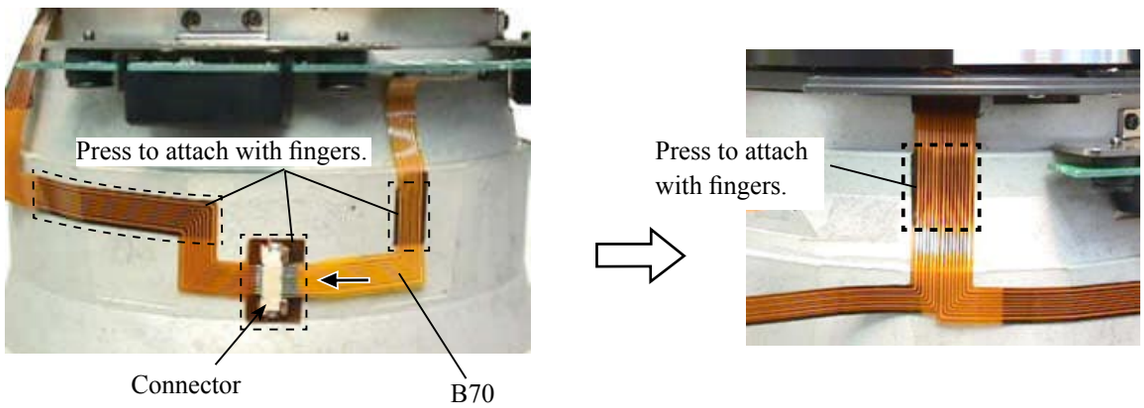
① Insert the gyro-relay FPC unit (B70) into the connector of the gyro unit (B69) to connect them.

② Assemble the gyro unit (B69) into the front fixed-tube, then fix them with 4 screws (#210).



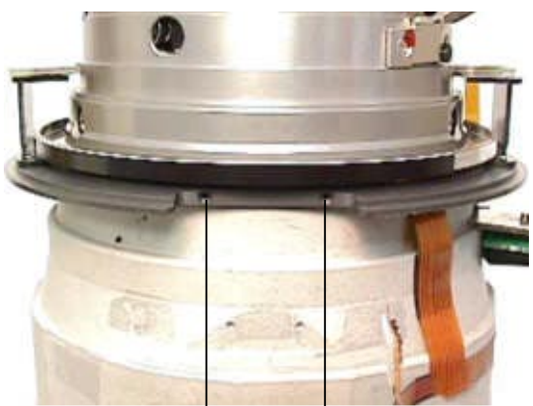
Gyro relay FPC unit

・ Insert the gyro relay FPC unit (B70) into the connector of the fixed-tube unit, and press to attach the FPC with fingers.



Attachment of GMR unit

① Attach the GMR unit on the fixed-tube unit with the screws (#115).

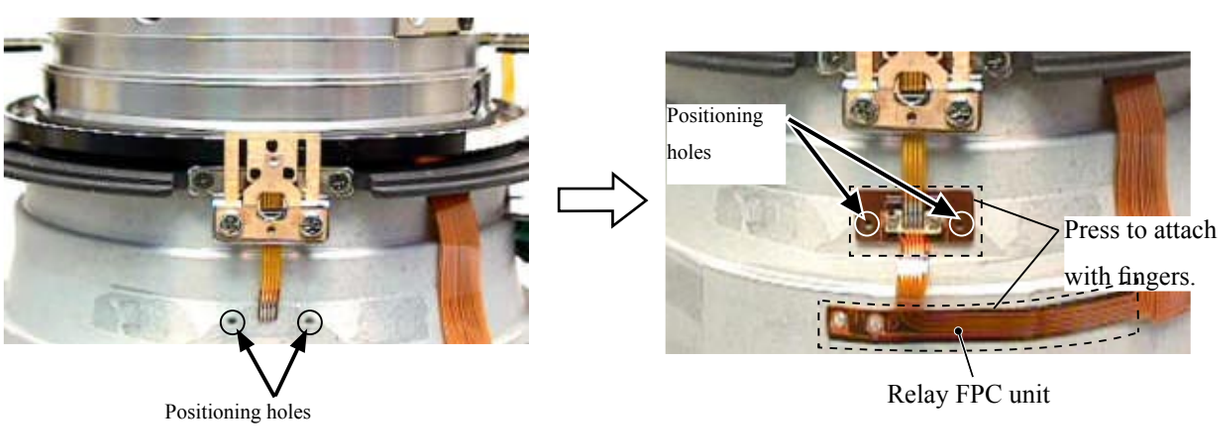


Adhesive: Lockend B

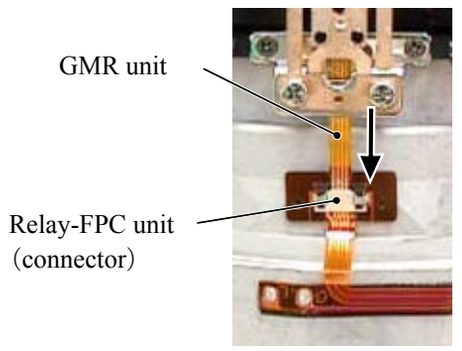
Apply slightly on the screw threads.

Note: Attach the GMR unit with its head touching the magnetic tape, and get the GMR unit upright vertically to the tape.

② Align the positioning holes of the fixed-tube unit with the holes of the relay-FPC unit (connector), then press to attach them with fingers.



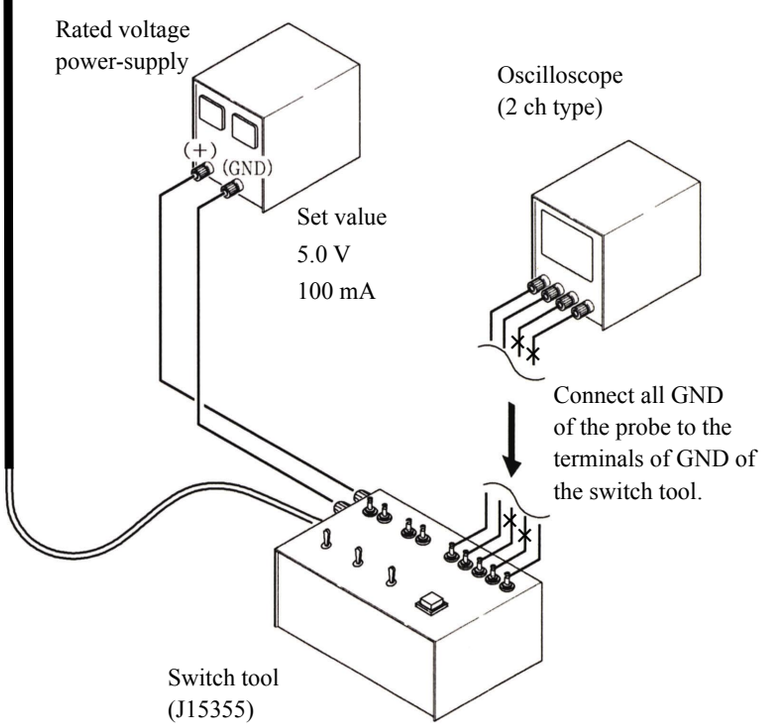
③ Insert the GMR unit (B19) into the relay-FPC unit (connector).



Output waveform inspection of GMR encoder

★ : New tool

【Attachment diagram】



(1) How to inspect:

① Turn the switch 1 to OFF, switch 2 to OFF and switch 3 to ON of the Switch tool.

② Confirm that the electric current and voltage of the connected rated voltage power-supply are set values, then turn it ON.

③ Set the oscilloscope and turn the focus ring manually.

④ Check the waveform of the oscilloscope by stopping with "START/STOP" key.

Note：The waveform varies according to the rotational speed of the focus ring. So change "Time/Div" setting accordingly.

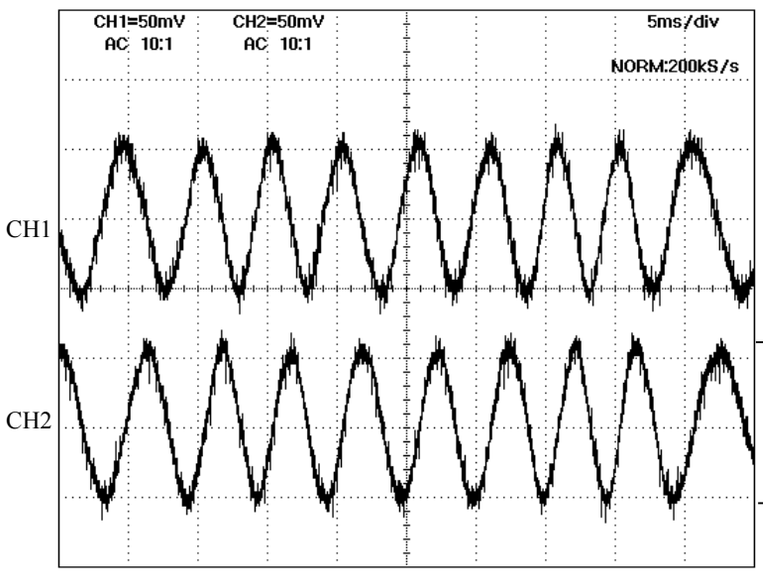


Fig. 1

● Oscilloscope setting

V/Div (ch1)	: 50 mV
V/Div (ch2)	: 50 mV
Coupling	: AC
Time/Div	: 5 m Sec
Trigger Mode	: NORMAL
Trigger Coupling	: AC

Standard: **Amplitude of all pulses/ waveforms is 80mV or more.**

Note: **Check the waveform by moving the focus ring back and forth from the infinity-end to the close-end positions entirely.**

⑤ In case large waveform-noise is detected, use the FILTER function.
How to set FILTER function (e.g. DL1540 manufactured by YOKOGAWA)
1. Press the FILTER button.
2. Select “Smooth” of the menu on screen and turn it ON.

⑥ In case the amplitude is small, when the deformation is detected in the GMR head, correct the deform of the GMR head. On the other hand, when such correction is impossible or no deformation is detected, replace the GMR unit. (Fig.2)

Note: When adjustments are made, prevent the magnetic tape and MR head from touching the magnetized driver bit. Otherwise, the magnetic data may be damaged.

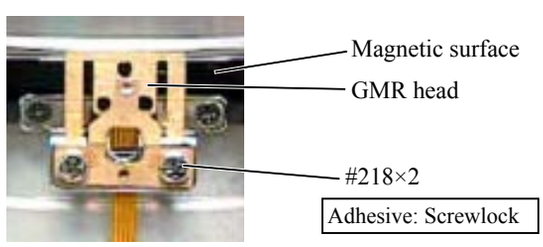


Fig. 2

＜ Ref. ＞

● As shown in Fig. 1, if the only amplitude of either CH1 or CH2 is small, one of the 2 screws (#218) may be loosened, so check for it. If this is not the case, the GMR head may malfunction, so be sure to replace the GMR holder unit and make a readjustment.

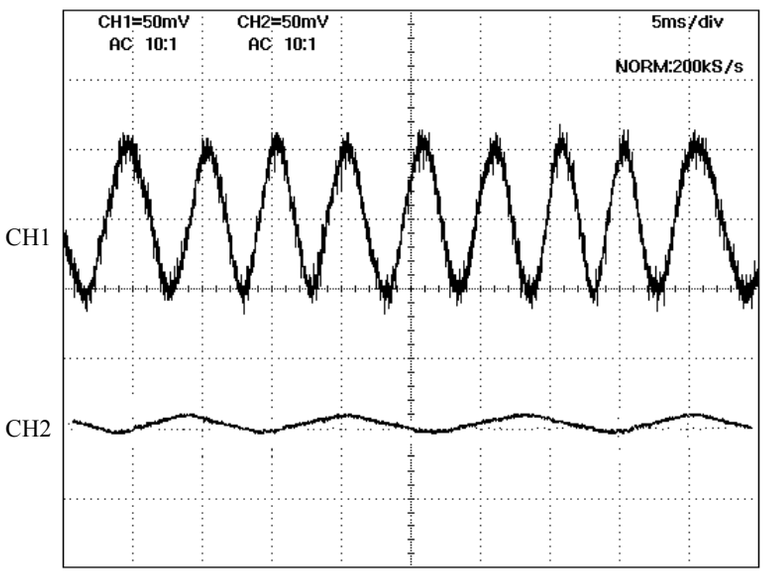


Fig.1

● As shown in Fig. 2, if the amplitude partially drops between the infinity and the close-distance, the magnetic data of the tape may be damaged.

In this case, replace the fixed-tube unit and make a readjustment. Replacing only the magnetic surface is impossible.

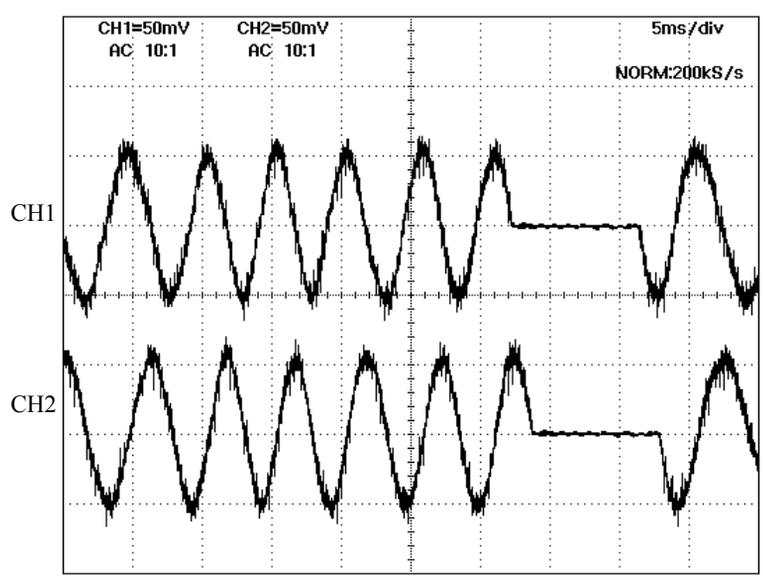


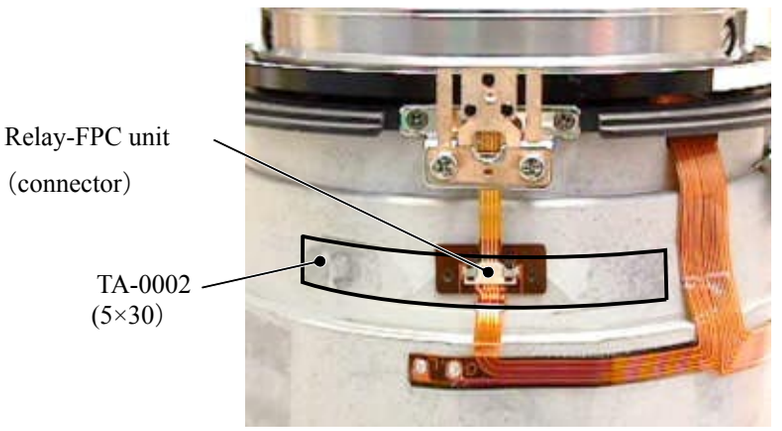
Fig.2

Fixed-tube unit

⑦ Turn off the rated voltage power-supply.

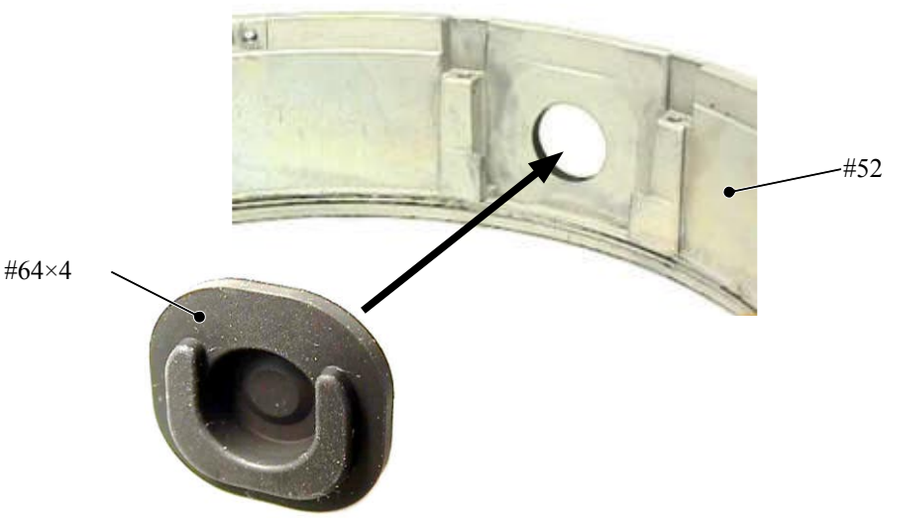
(2) Attach tape

・ Attach the tape [TA-0002(5×30)] on the relay-FPC unit (connector).

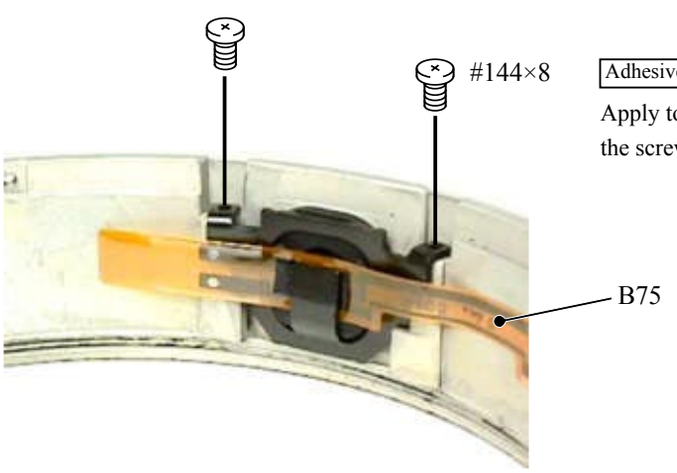


AF-lock ring

① Assemble the 4 AF-lock rubbers (#64) into the AF-lock ring (#52).



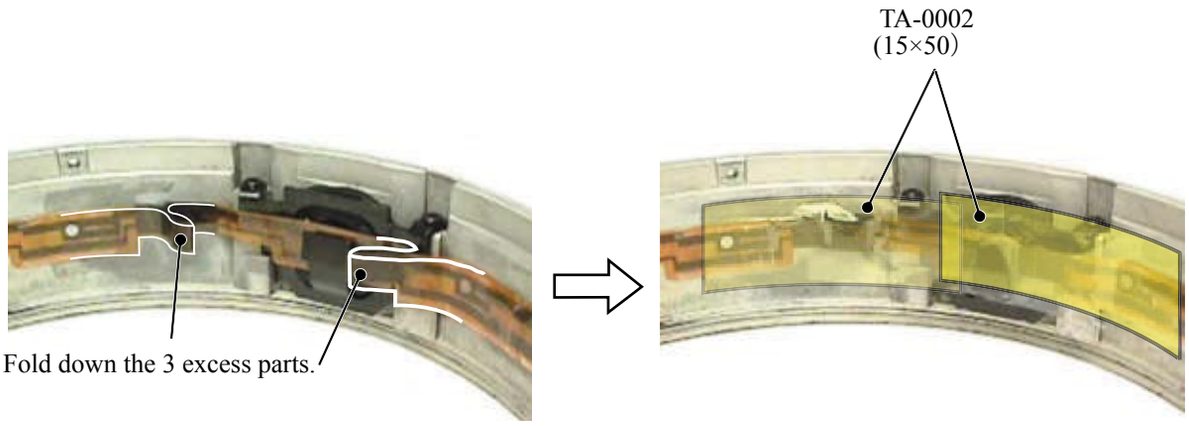
② Attach the AF-lock FPC unit (B75) to the AF-lock ring (#52) with 8 screws (#114).



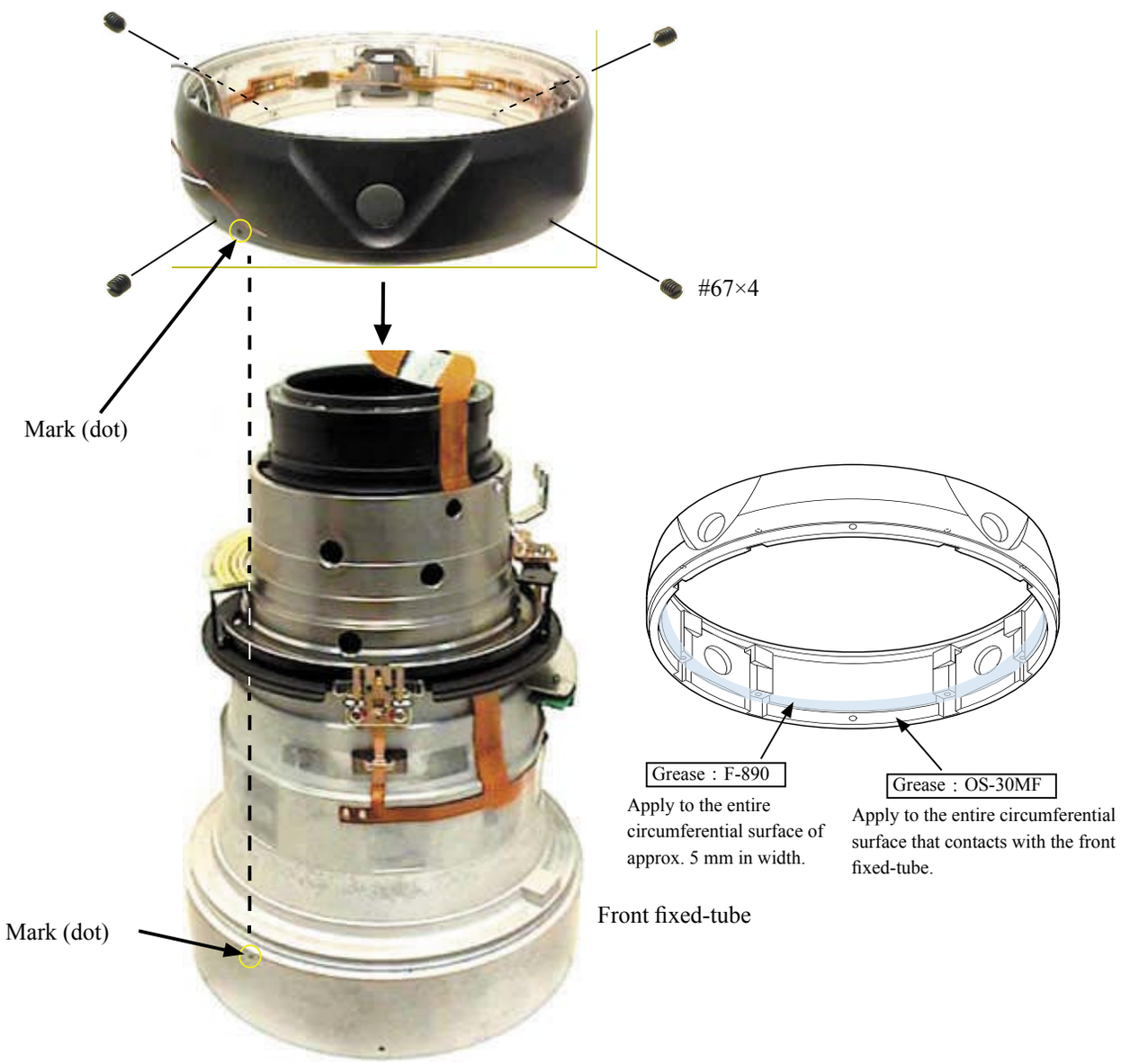
Adhesive: Lockend B

Apply to the threads of the point of the screw.

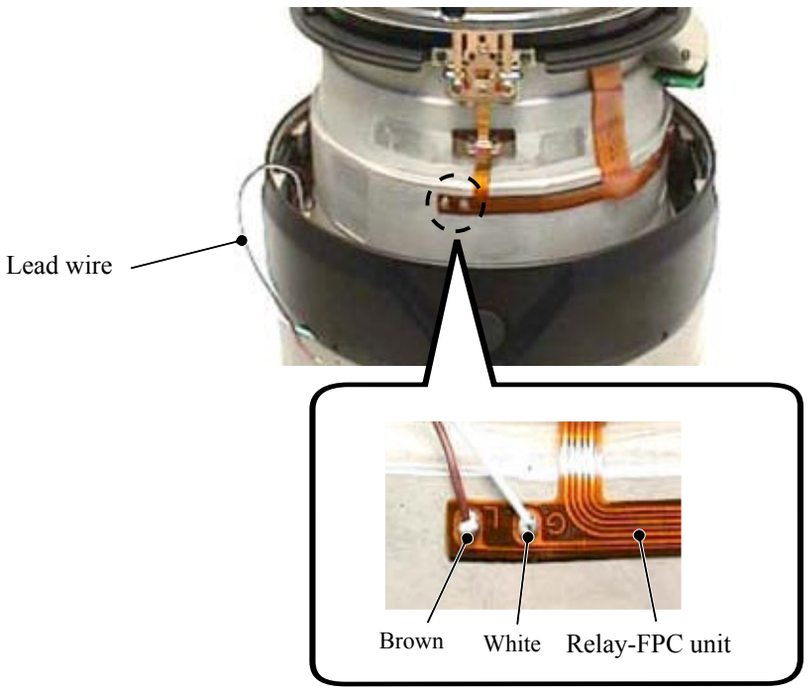
③ Fold down the excess parts of the AF-lock FPC unit at 3 locations, then attach the polyester film.



④ Put the AF-lock ring (#52) on the front fixed-tube (#35) and fix them with 4 setscrews (#67).


#67×4
Mark (dot)
Mark (dot)
Grease : F-890
Apply to the entire circumferential surface of approx. 5 mm in width.
Grease : OS-30MF
Apply to the entire circumferential surface that contacts with the front fixed-tube.
Front fixed-tube

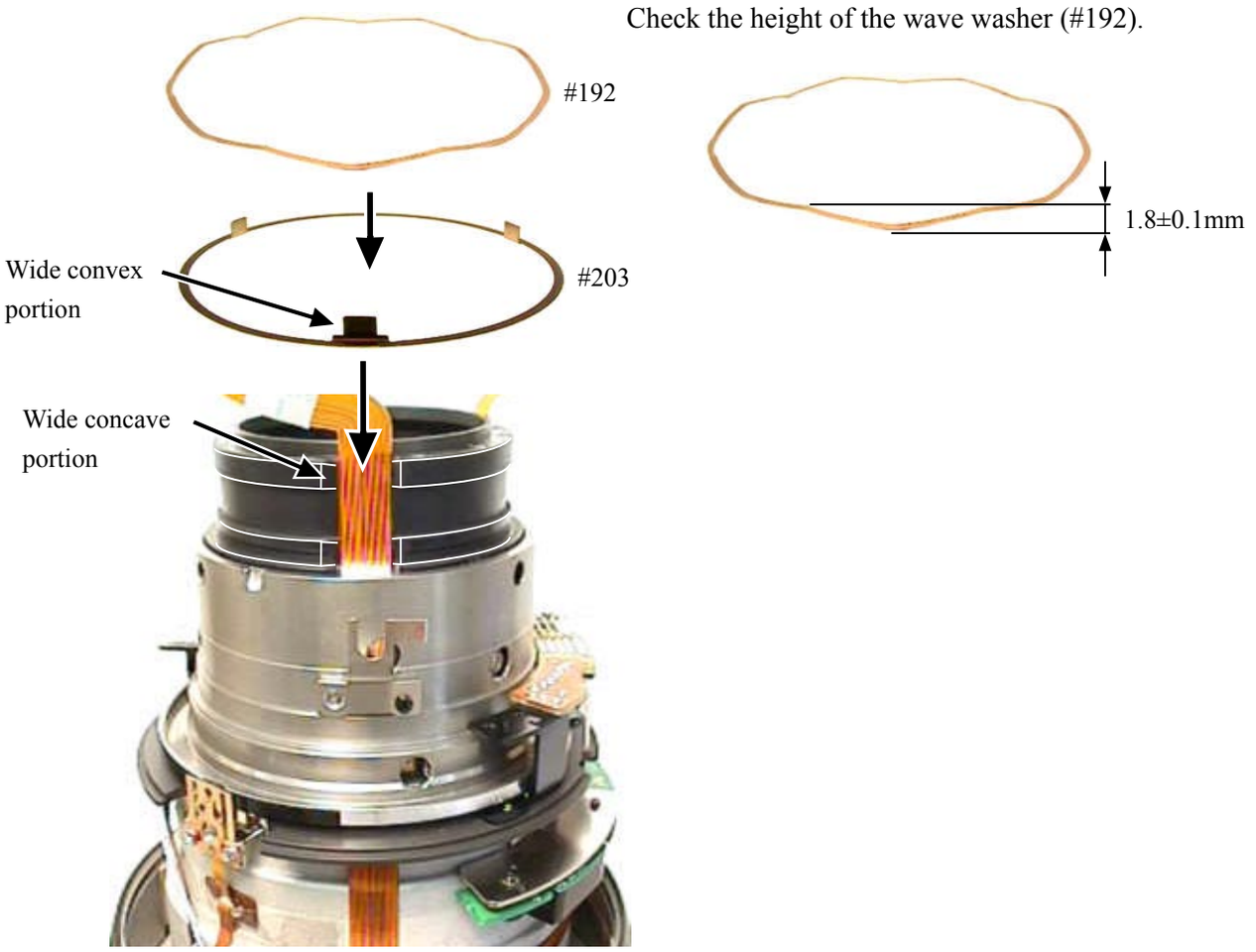
⑤ Solder the lead wire (FL-FPC) on the relay-FPC unit.



FPC retainer, Wave washer

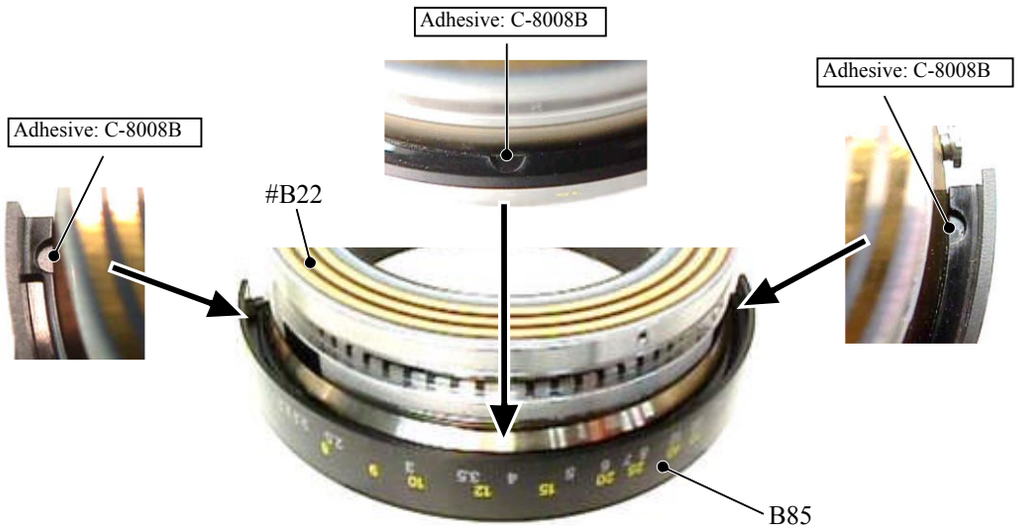
・ Assemble the FPC retainer (#203) and wave washer (#192) into the fixed-tube unit.

Check the height of the wave washer (#192).

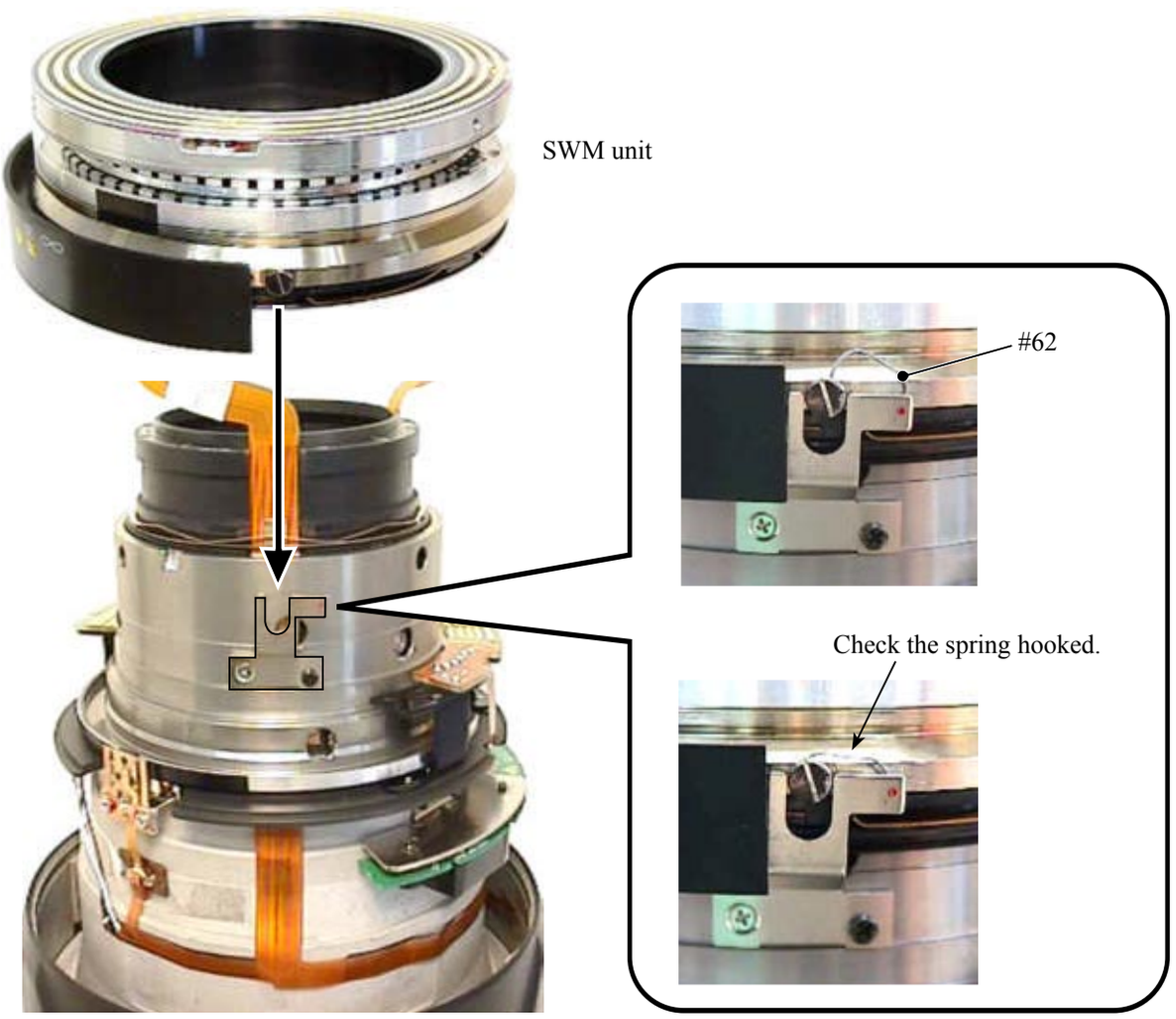


Assemble into SWM unit temporarily

- Assemble the focusing index ring unit (B85) into the SWM unit (#B22).



- Assemble the SWM unit, and hook the SWM backlash-removing spring (#62).

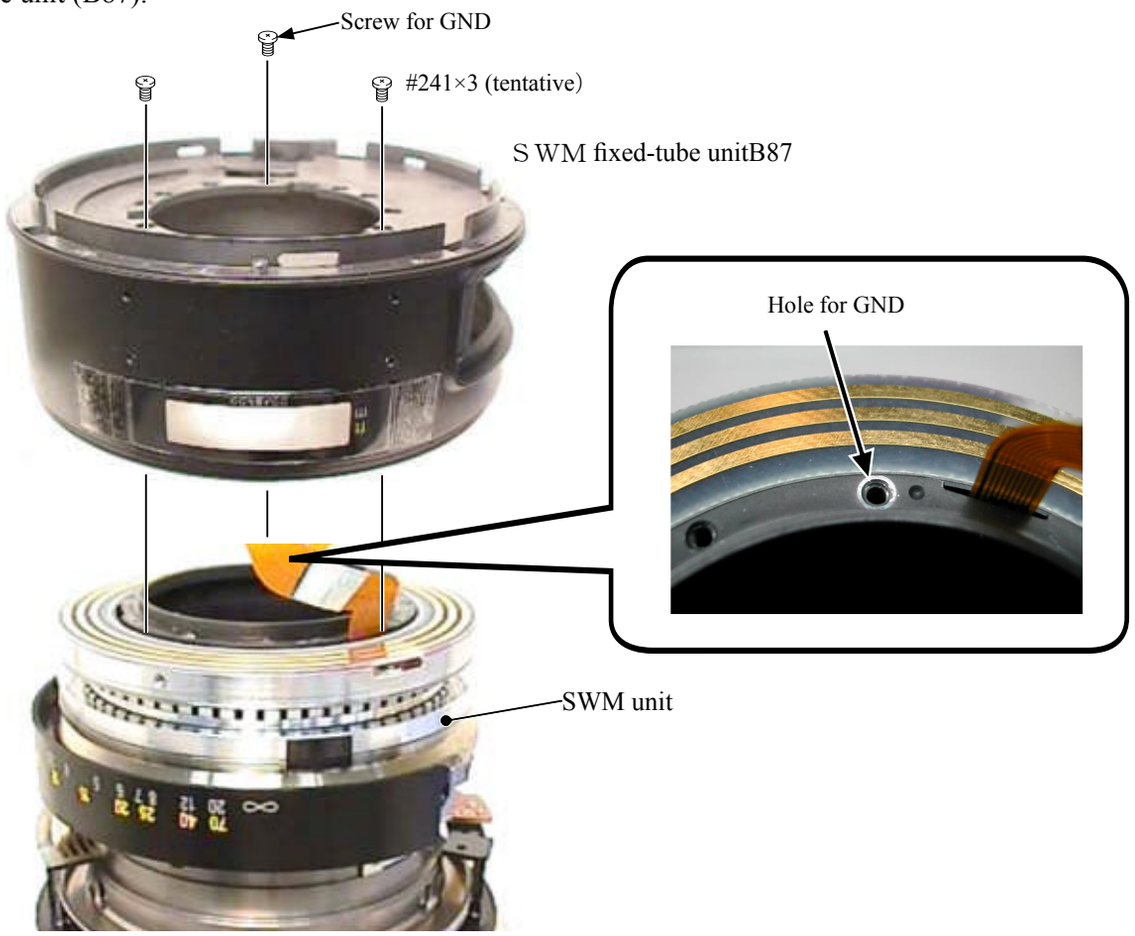


Note: The assembly here is just temporary for “Position adjustment of Distance encoder brush” on the next page.
So, apply the adhesive to the spring (#62) at the stage of "SWM unit" on Page A13.

Position adjustment of Distance encoder brush

1) Attach SWM fixed-tube unit temporarily

・Attach 3 screws (#241) temporarily to the 3 locations, including the screw hole for GND of the SWM fixed-tube unit (B87).



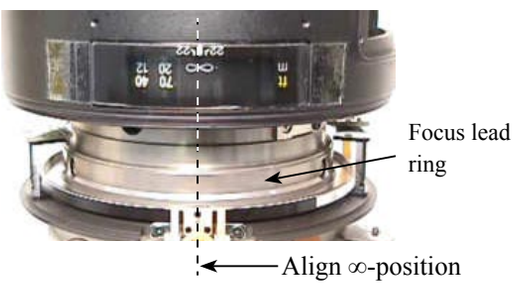
2) Adjust position of Distance brush

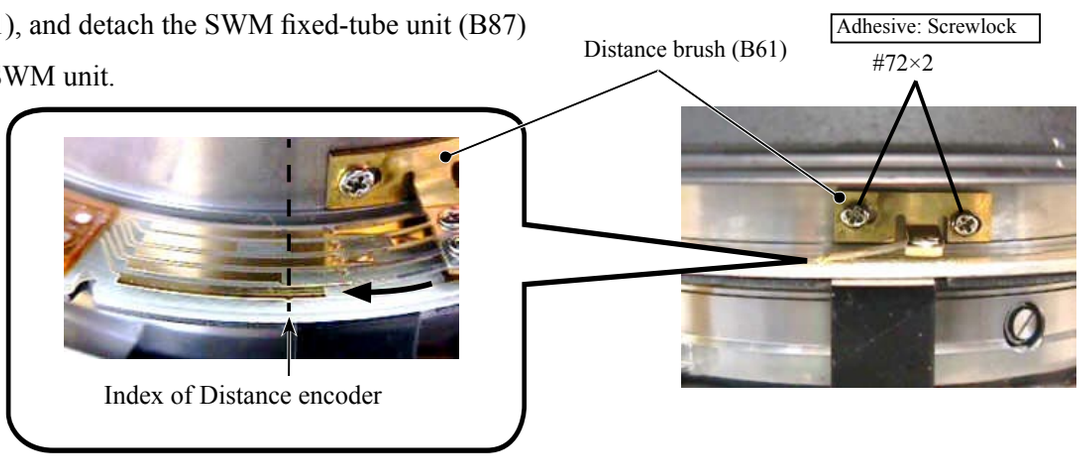
① Turn the focus lead ring, and align the index and the "∞"-mark of the distance scale.

② Loosen 2 screws (#72) so that the distance brush (B61) touches the index of the distance encoder, then make an adjustment by moving the distance brush (B61).

③ After tightening 2 screws (#72), fix them with Screw-lock.

④ After the adjustment, remove the tentative 3 screws (#241), and detach the SWM fixed-tube unit (B87) and SWM unit.





Backlash adjustment of MR ring (small) unit

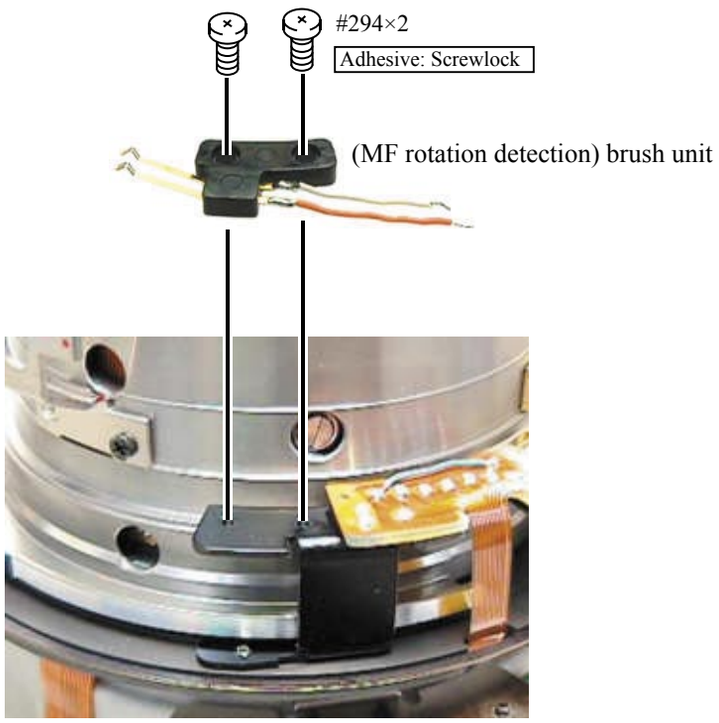
① Assemble the SWM fixed-tube unit (B87), MF ring (small) unit (B88), washers (#179 and #177), and check the backlash amount.

Note: When the MF ring (small) unit (B88) is replaced, adjust the backlash amount by using washers (#177A-G × n).

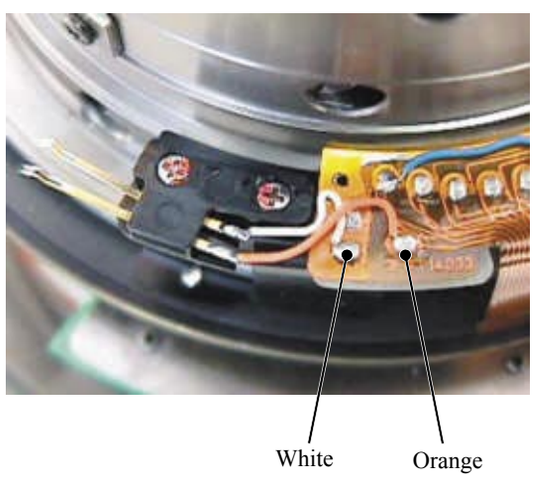
② After the adjustment, remove the SWM fixed-tube unit (B87) and MF ring (small) unit.

(MF rotation detection) brush unit

① Attach the (MF rotation detection) brush unit.



② Solder wires.

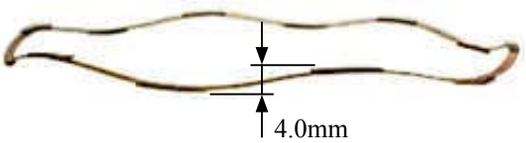


③ Attach the polyester tape (#312) on the lead wire of the (MF rotation detection) brush unit.

MF ring (small) unit, Wave washer unit, SWM unit

- Assemble the MF ring (small) unit (B88), wave washer unit (B34) and SWM unit.

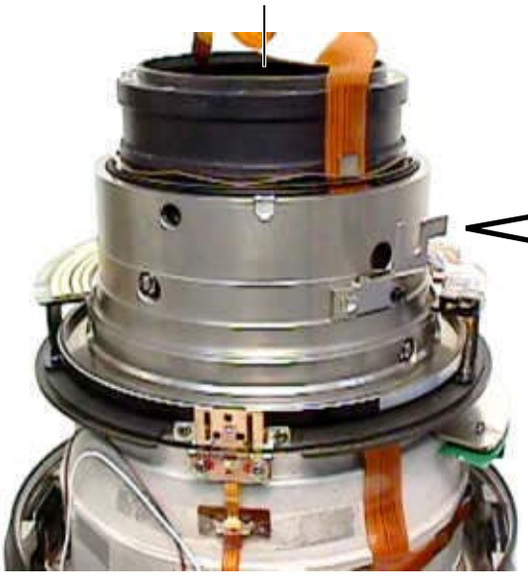
Check the height of the wave washer unit (B34).

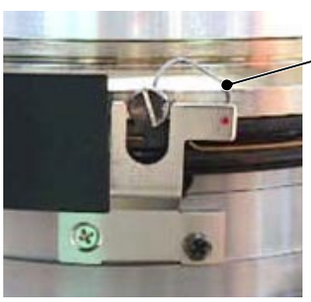


SWM unit

Wave washer unit (B34)

MF ring (small) unit





Check the spring hooked.

Inspection & adjustment of Transparant-ring movement

① Attach 3 guide rollers (#108) with 2 screws (#104) temporarily.

② Mount the SWM fixed-tube unit (B87) with 3 screws (#241) temporarily.

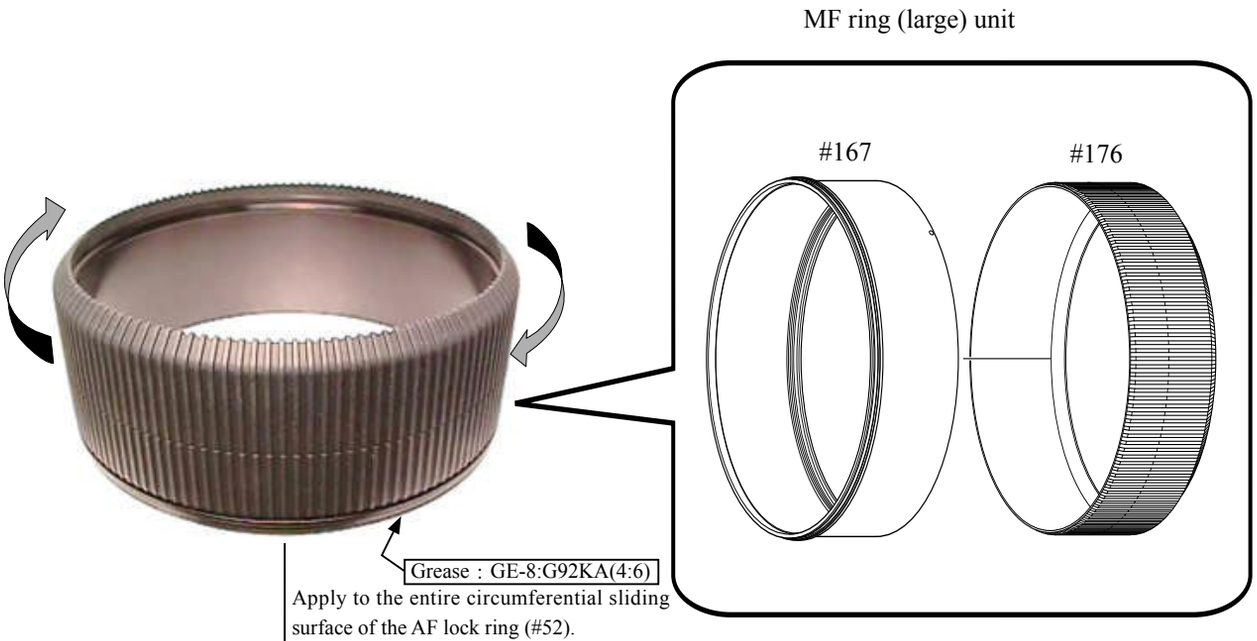
Inspection :
Check that when the MF ring is rotated, the focus lock ring subsequently turns together with it, and also when the MF ring is further rotated all the way to the end, the SWM unit does not turn.

Adjustment :
In case defectives are found in the above, adjust by changing the washers (#92A-C) that are put between the transparent ring unit (B91) and the adjustment ring unit (B92).

③ After the inspection and adjustment, remove 3 screws (#241) and detach the SWM fixed-tube unit (B87).

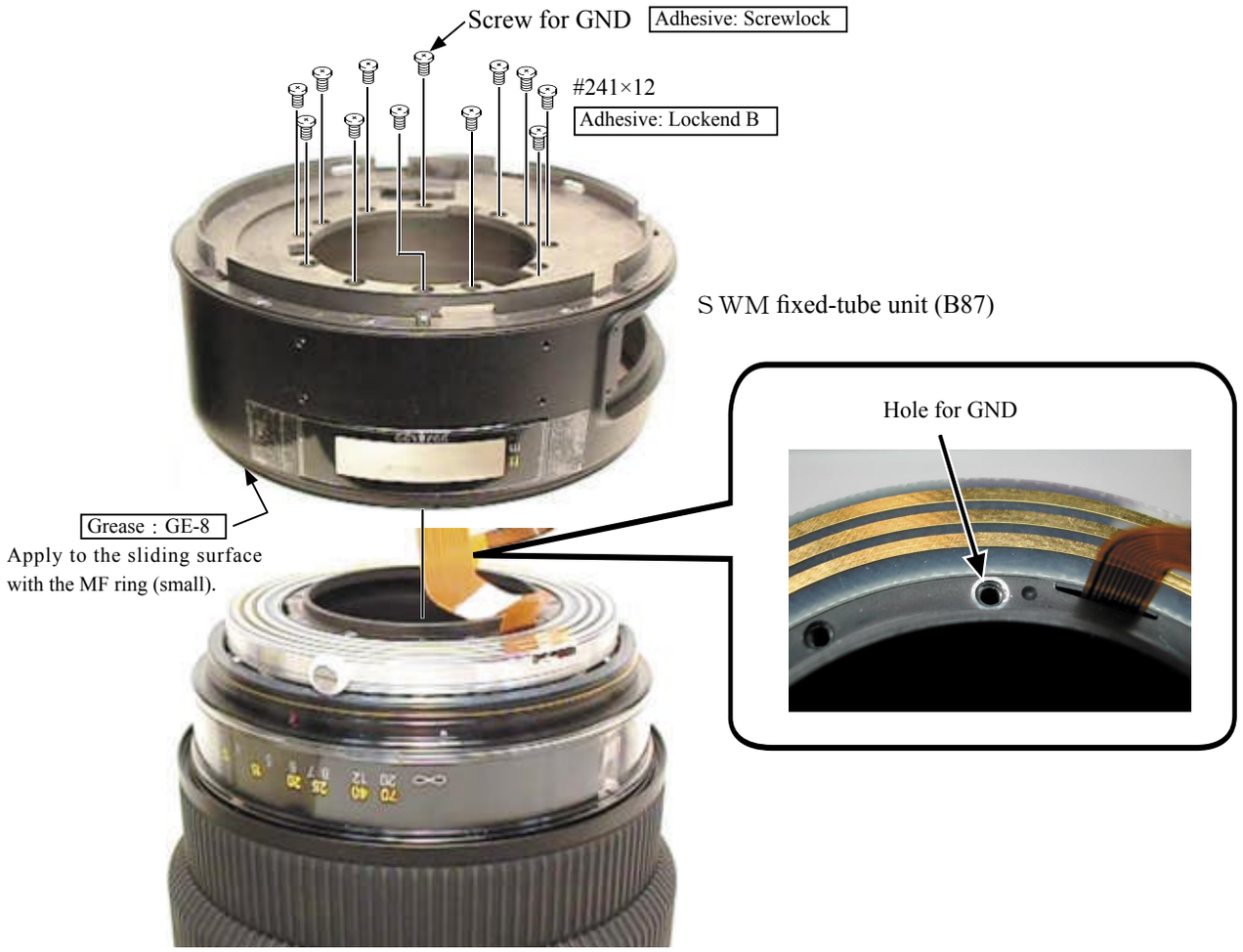
④ Apply the Lockend B to the screw holes of 3 screws (#104), and tighten them again.

MF ring (large) unit



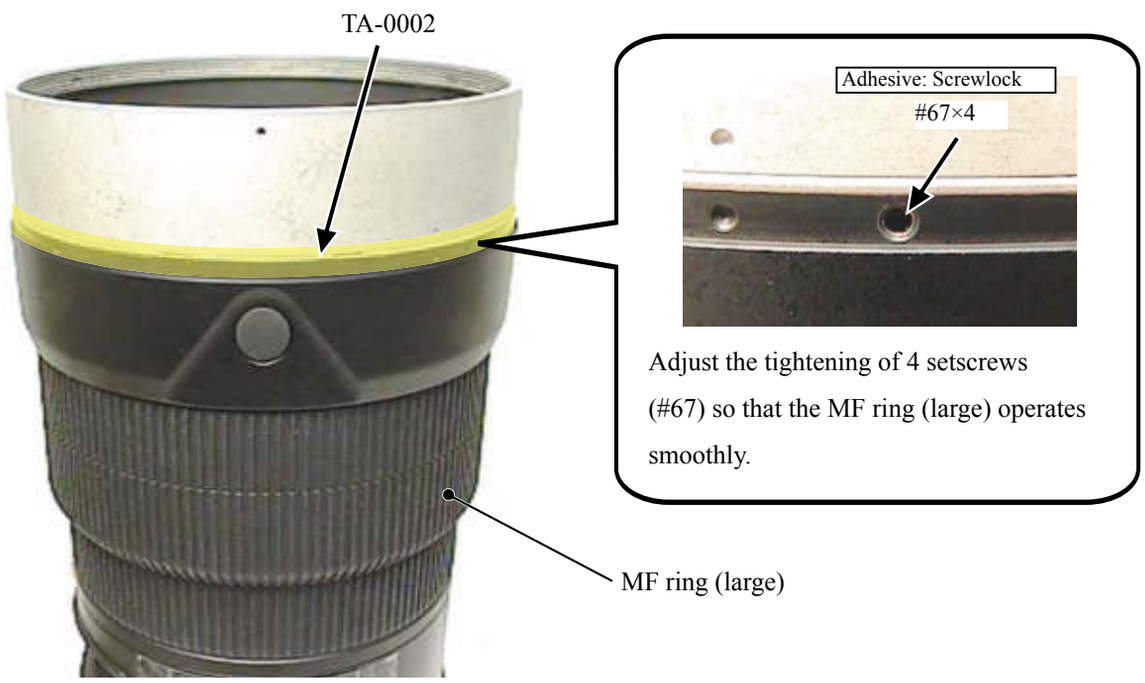
SWM fixed-tube unit

Note: Do NOT apply Lockend B to the screws for GND.

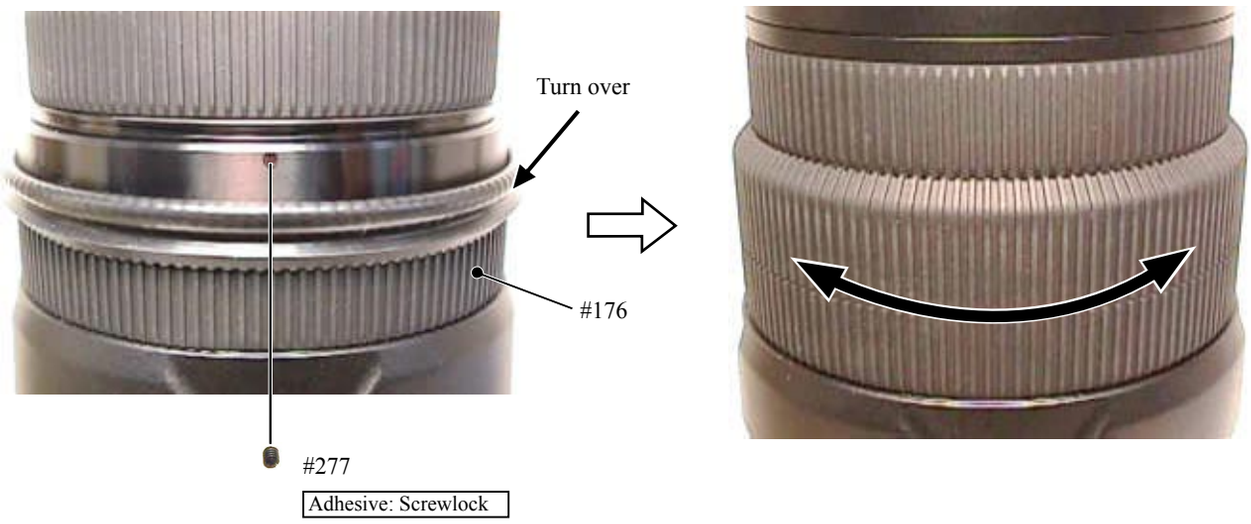


Check MF ring operation

① After adjusting the tightening of setscrews, cut the polyester tape (TA-0002) into appropriate size and attach it.

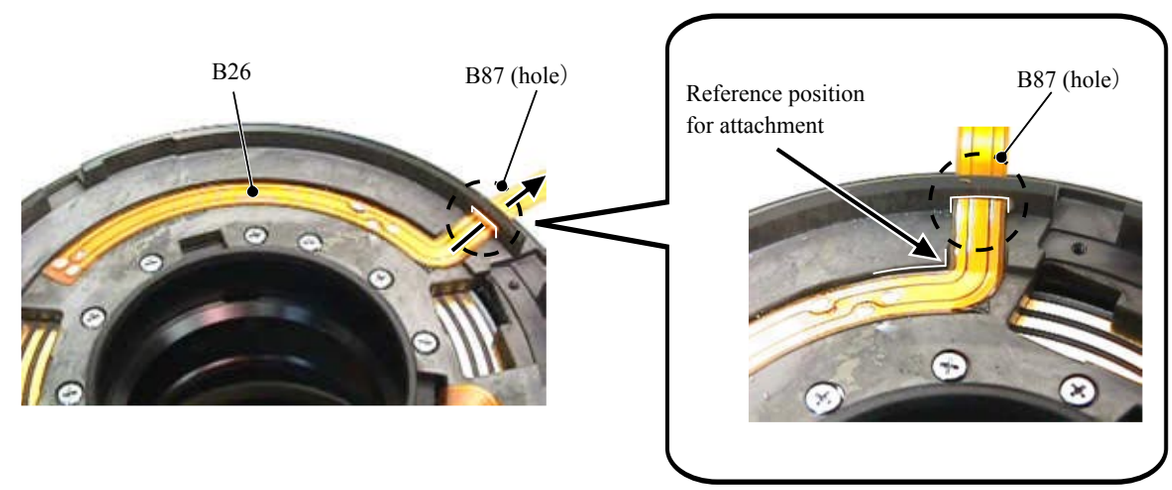


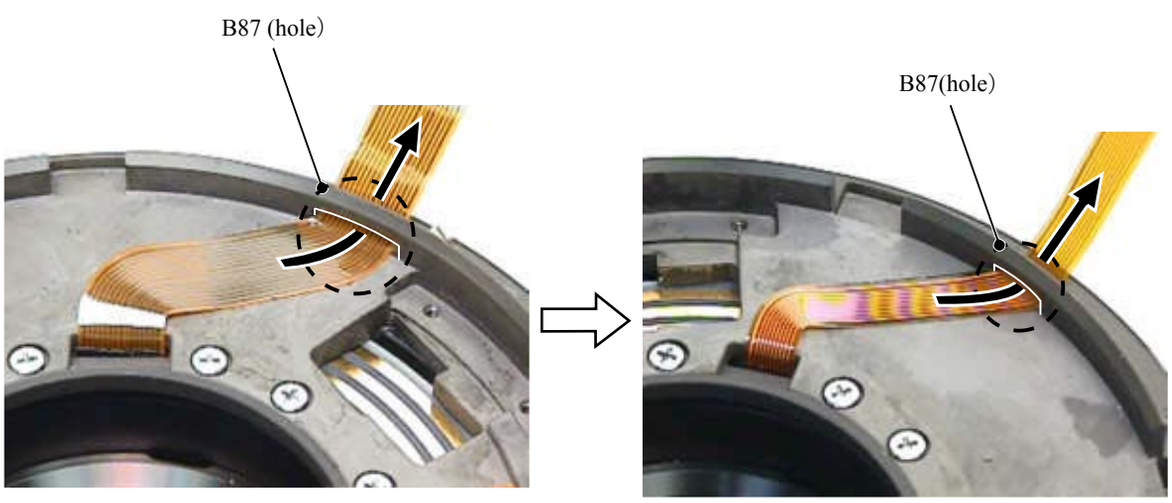
② Turn the rubber ring (#176) over, and check the smoothness of the MF ring operation by fixing the setscrew (#277).



SWM power FPC unit

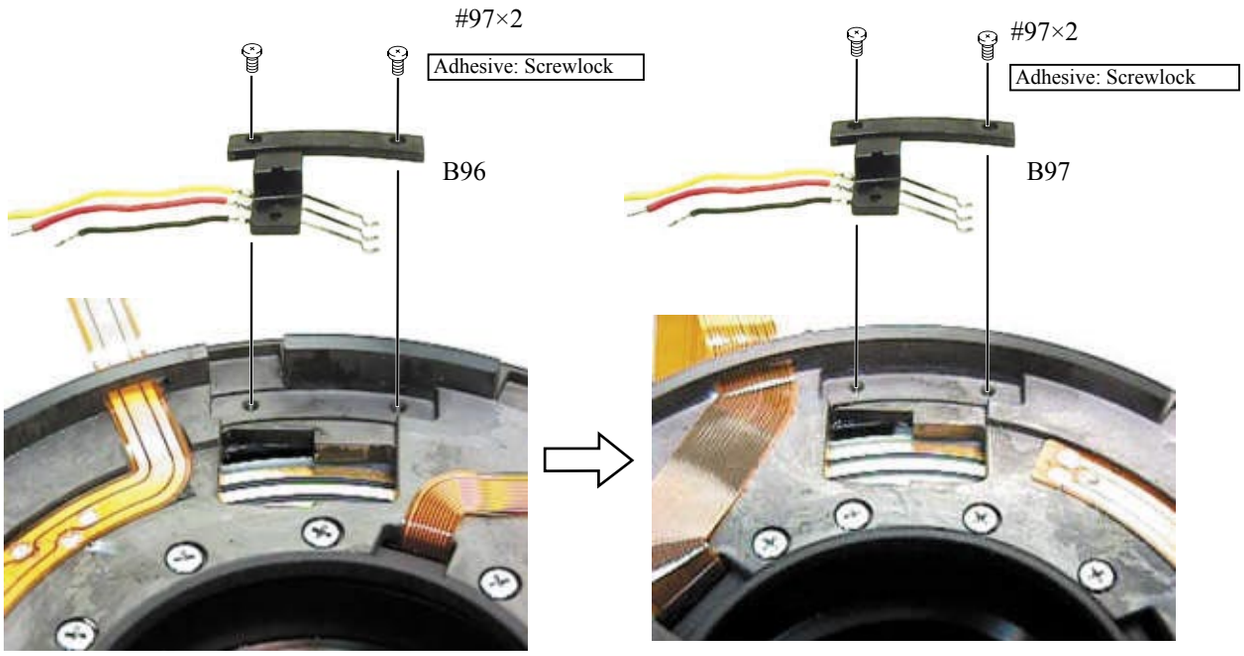
・ Pass the tip of the SWM power FPC unit (B26) through the hole of the SWM fixed-tube unit (B87), and attach it.



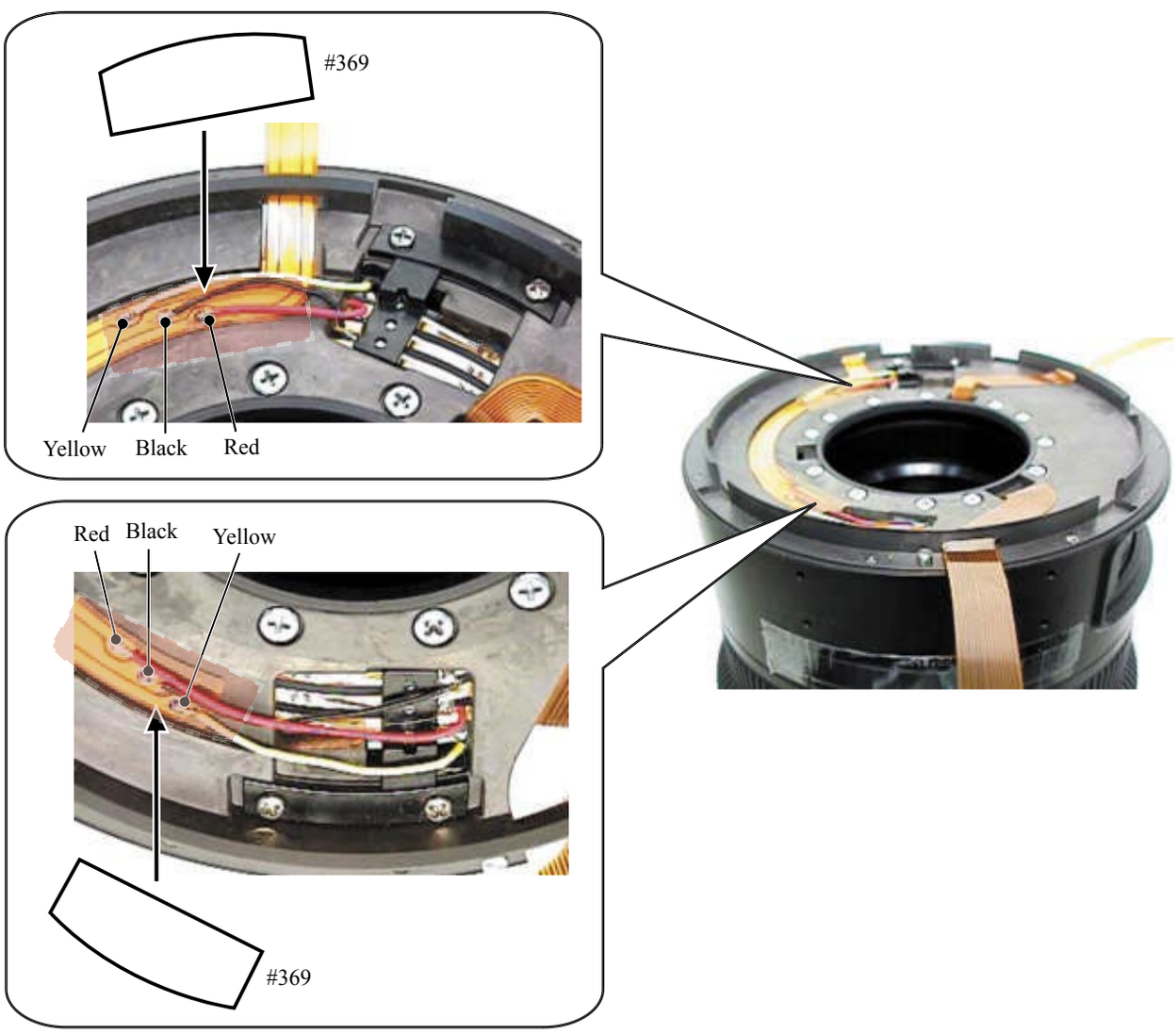


Power brush unit 1 & 2

・Assemble the power brush unit 1 (B96) and 2 (B97) into the SWM fixed-tube unit (B87) with 2 screws (#97).

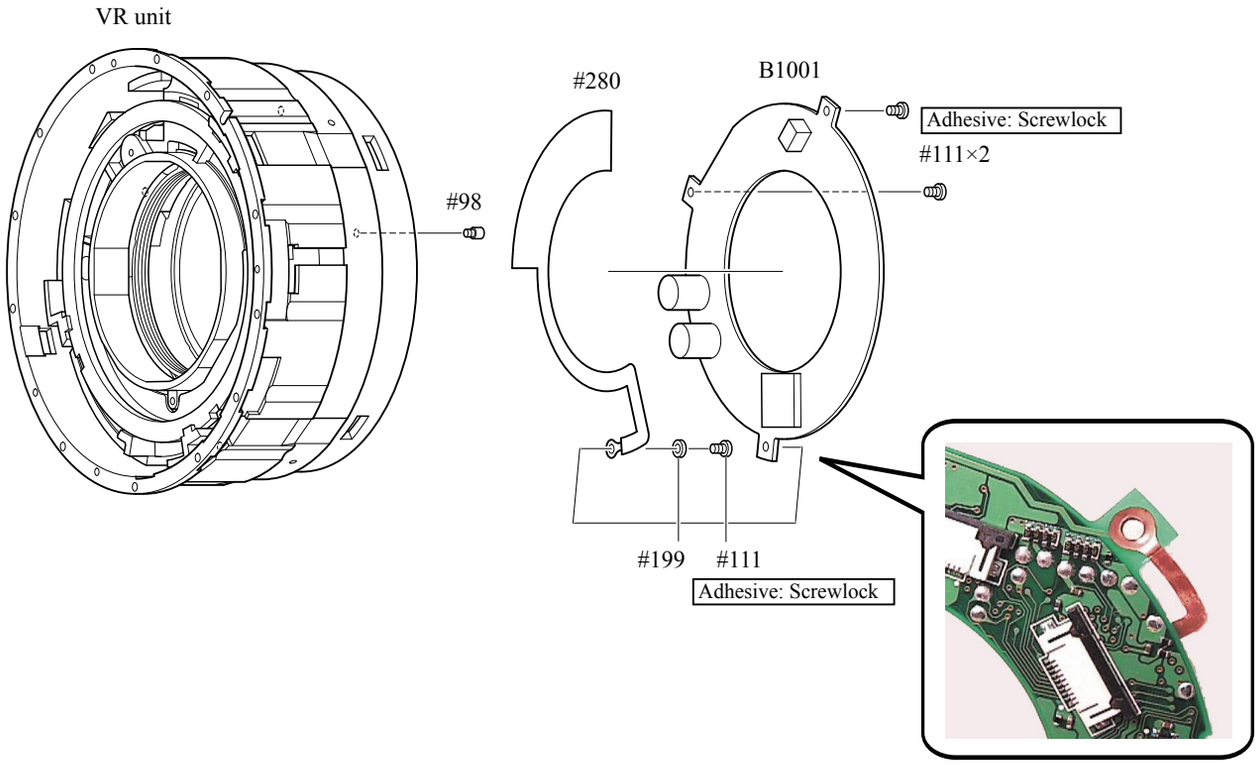


・ Solder the power brush unit 1 (B96), 2 (B96), and 6 lead wires on the SWM power FPC unit (B26).

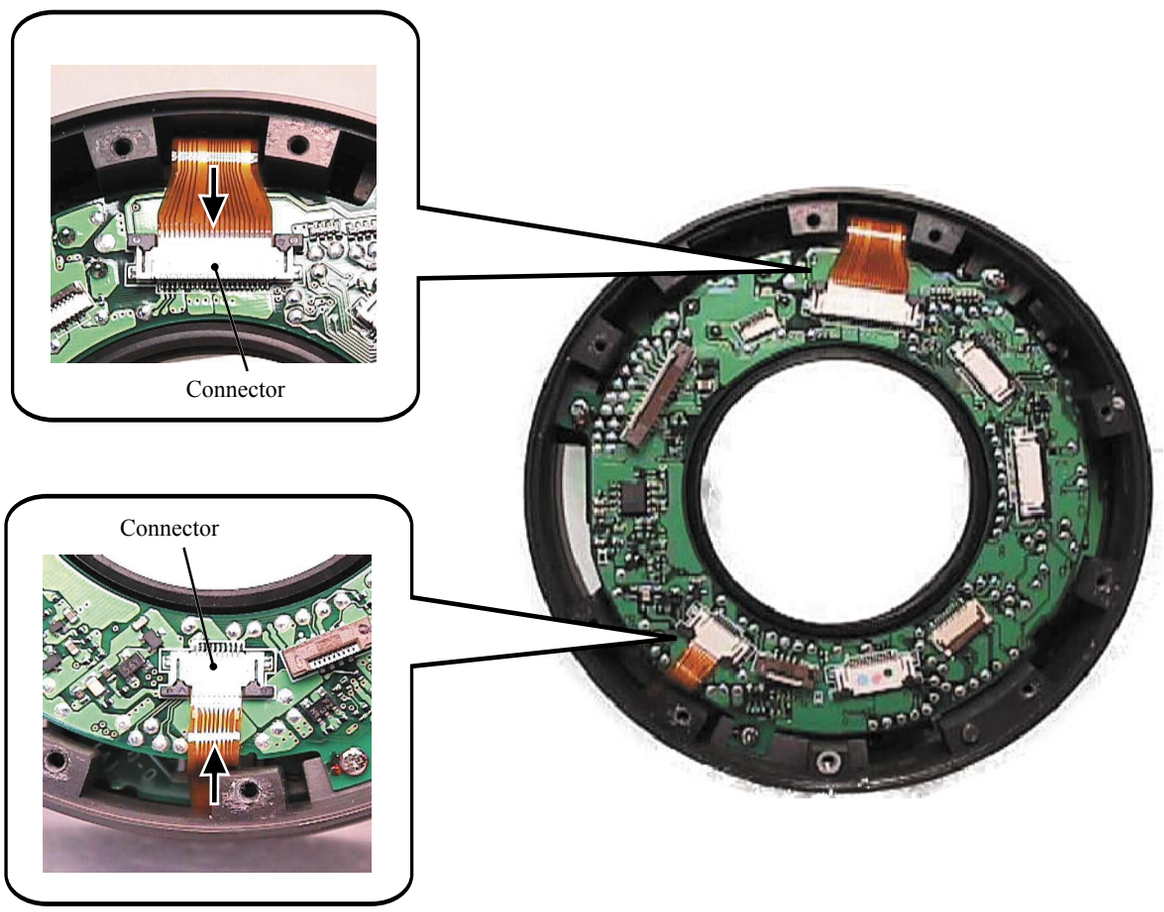


VR unit

① Fix the main PCB unit (B1001) and shield (#280) on the VR unit with the washer (#199) and 3 screws (#111×3).



② Insert the FPC into the connector of the VR unit to connect them.



3rd lens group

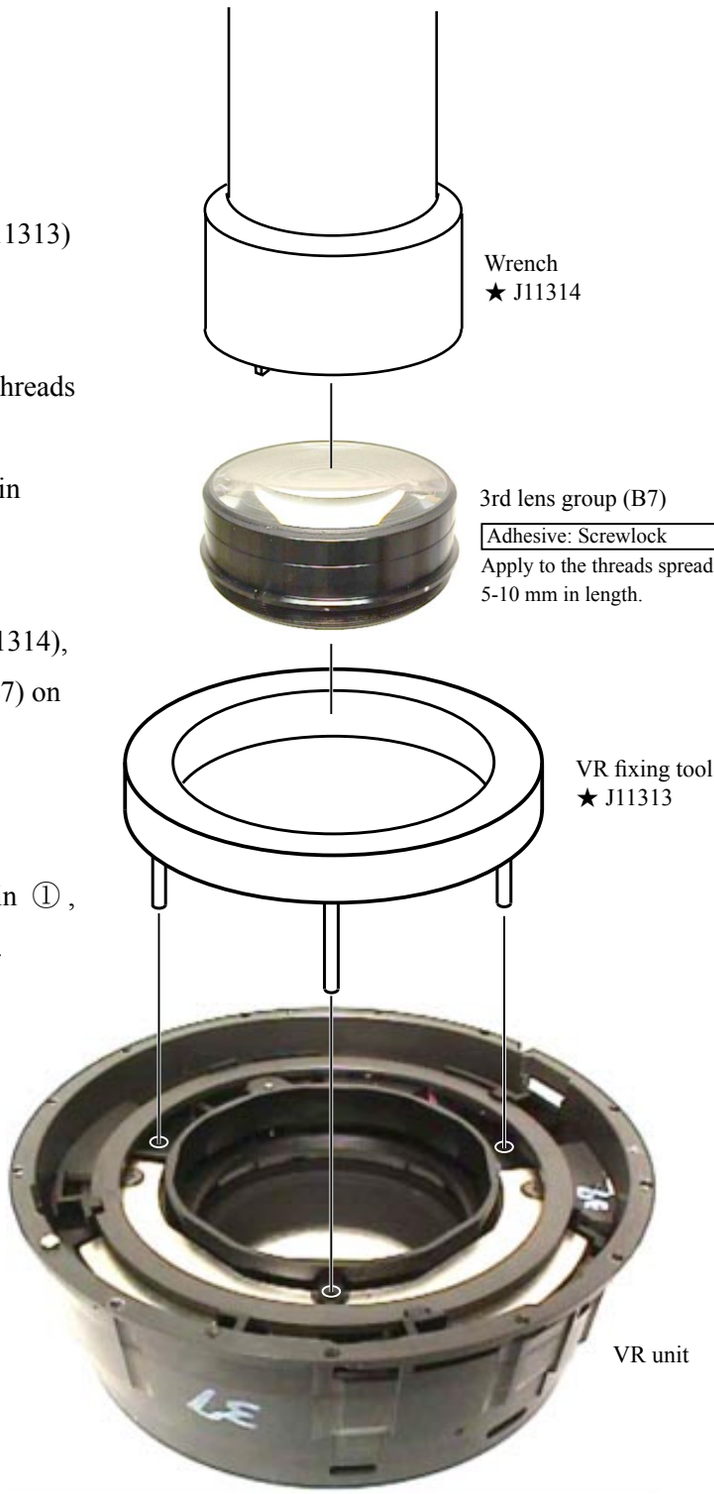
★ : NEWTOOL

① Fit the VR fixing tool (★ J11313) in the VR fixed-tube unit.

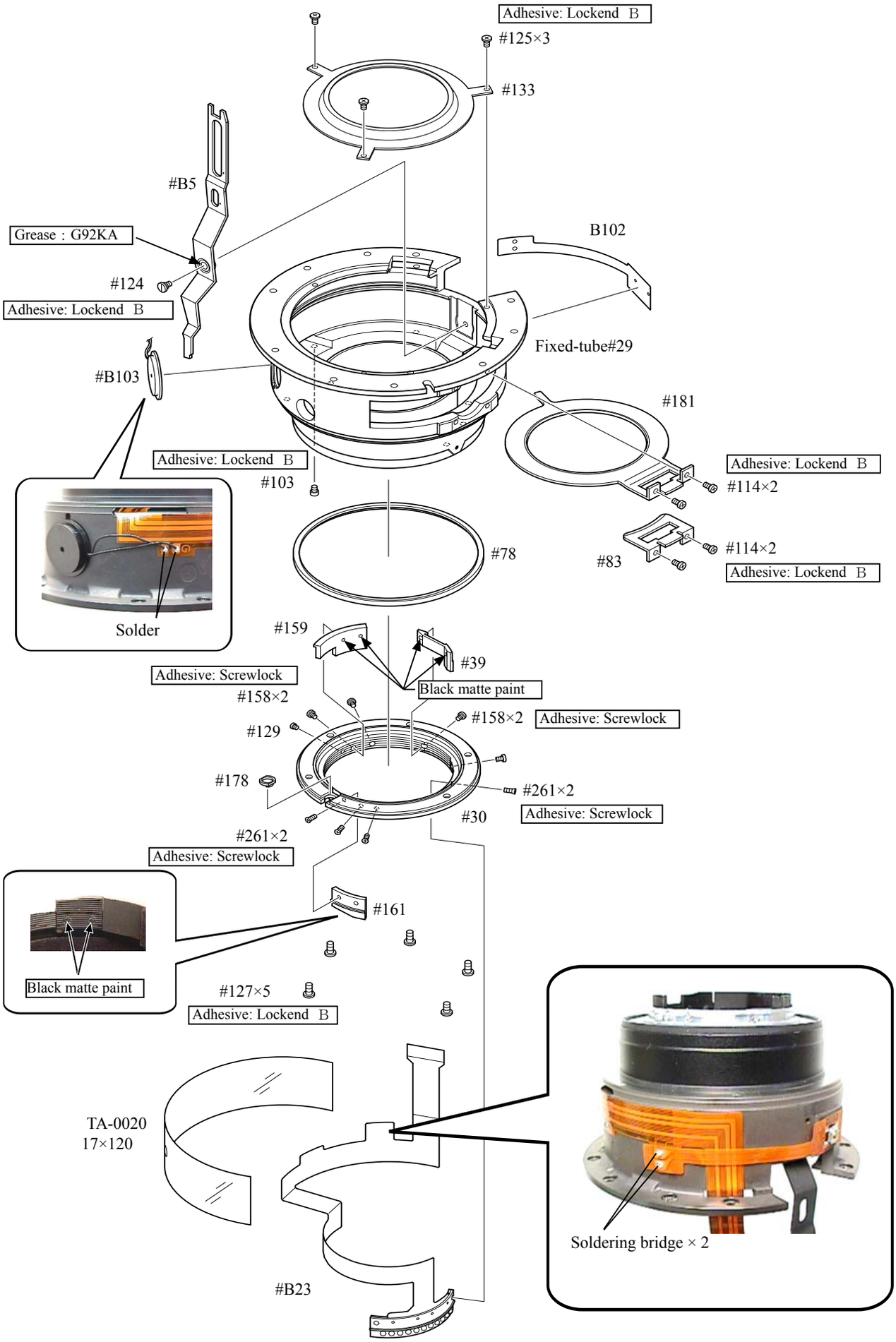
② Apply the Screwlock to the threads of the 3rd lens group (B7), spreading approx. 5-10 mm in length.

③ By using the wrench (★ J11314), mount the 3rd lens group (B7) on the VR fixed-tube unit.

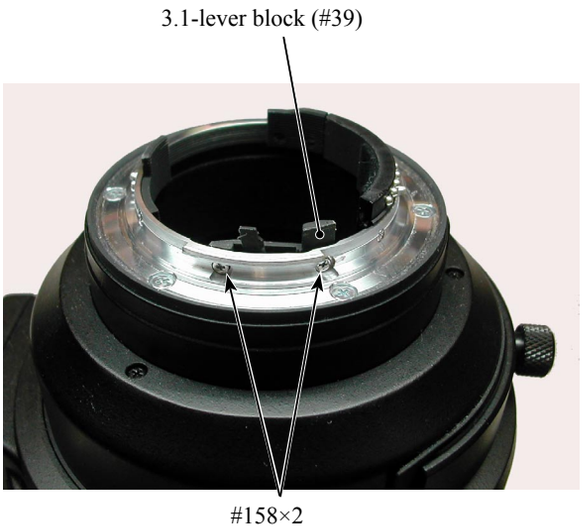
④ Remove the VR fixing tool (★ J11313), which was fit in ① , from the VR fixed-tube unit.

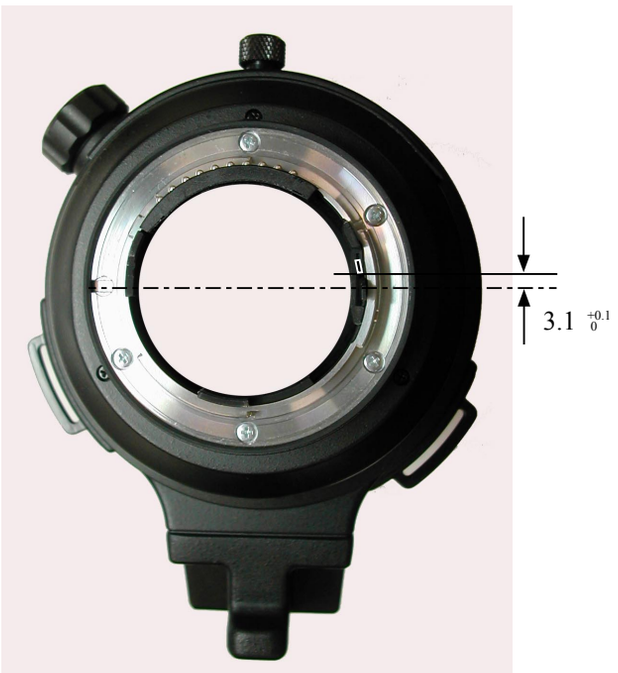


Rear fixed-tube unit



Position adjustment of Aperture lever





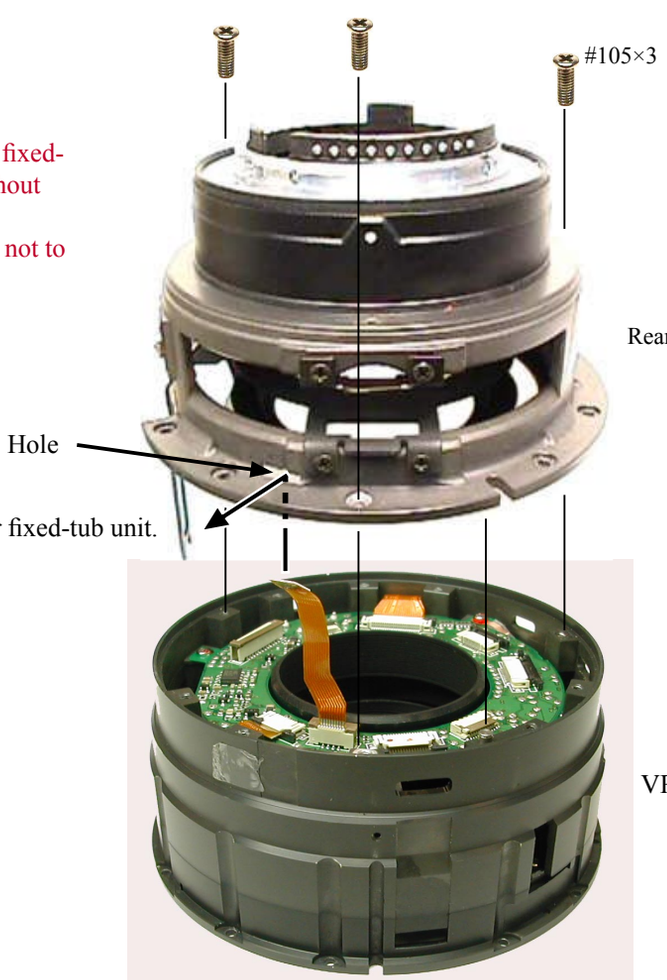
・Measure the 3.1-lever. Loosen 2 screws (#158) and move the 3.1-lever block (#39) so that the above width becomes 3.1 $^{+0.1}_{0}$.

Adjustment of Aperture diameter

1. Prepare adjustment of Aperture diameter

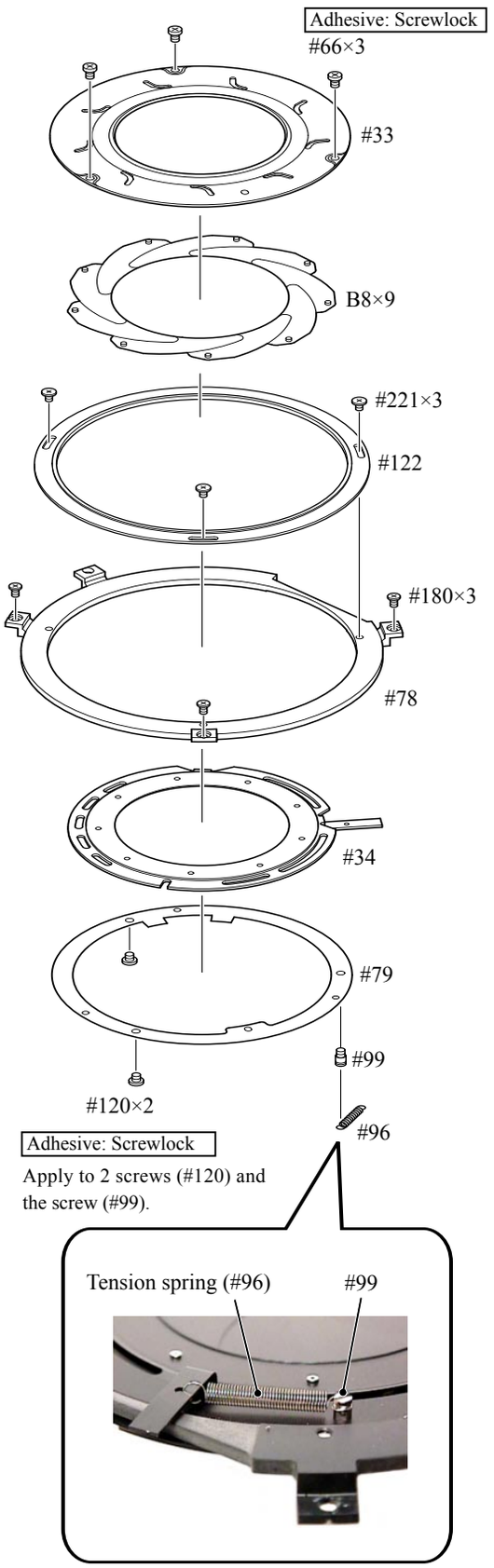
① Assemble the rear fixed-tube unit and VR unit, then attach them temporarily with 3 screws (#105).

Note:
The FPC that connects from the rear fixed-tube unit is temporarily attached, without being inserted into the connector.
When assemble the above, be careful not to pinch, etc, the FPC.

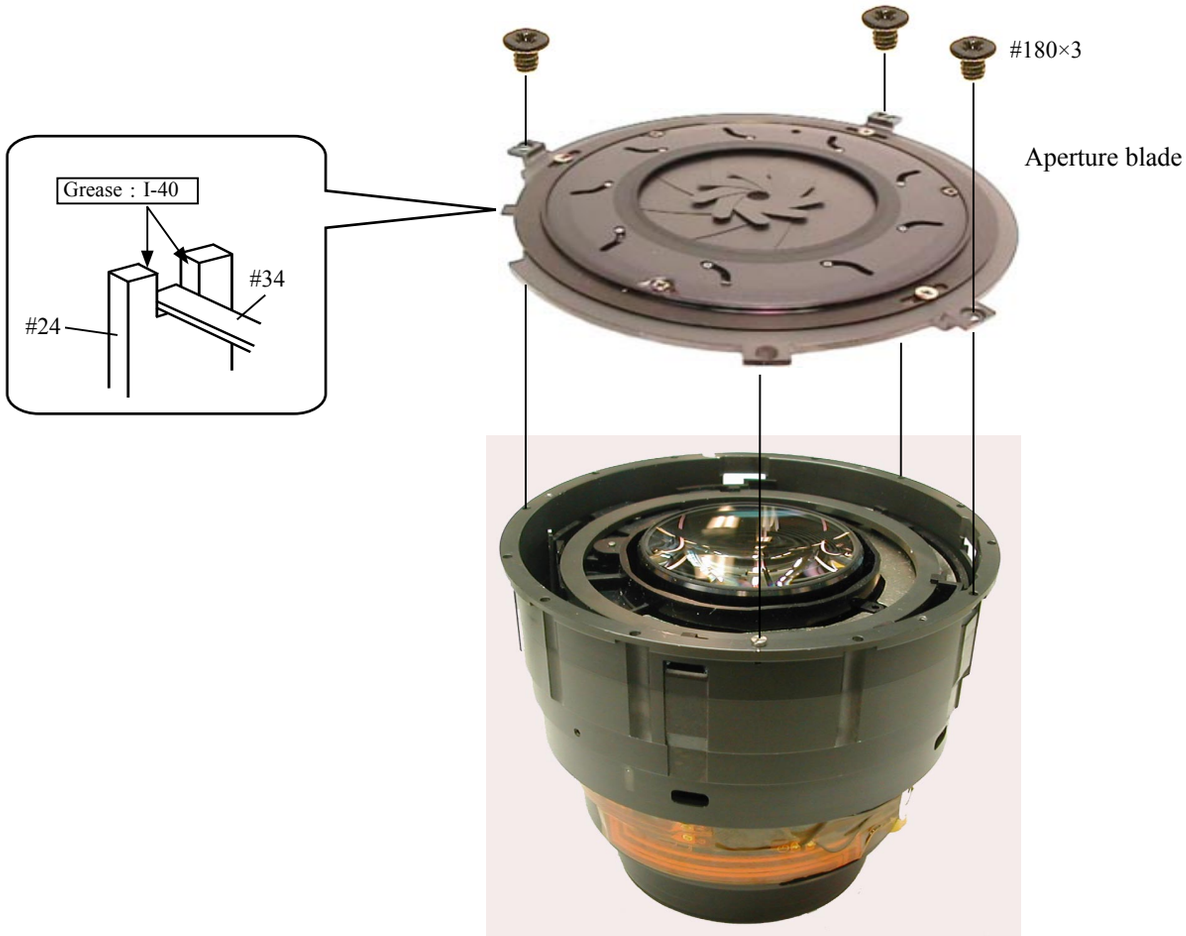


Aperture blade

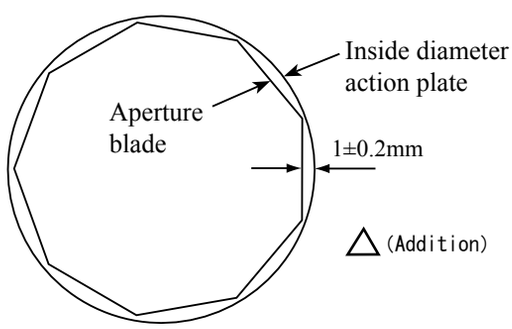
① Assemble the aperture blade unit.



② Assemble the aperture blade into the lens body.



Adjustment of Aperture diameter



- Move the aperture lever so that it is set to full aperture.
- Loosen 3 screws (#221) and turn the aperture unit to adjust the aperture diameter.

△(Revise)

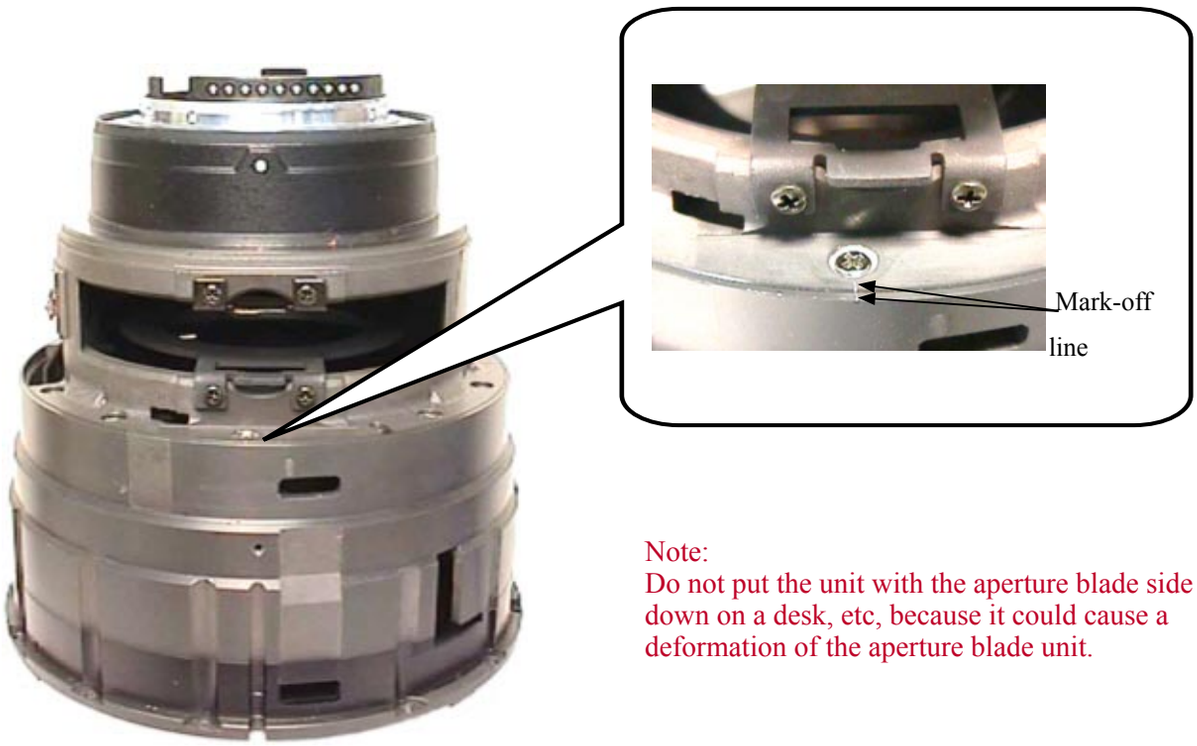
Standard: Aperture blade is positioned leaving space of 1mm ±0.2mm in the largest part from the inside diameter of the aperture action plate.

- After the adjustment, apply Screwlock on 3 screws (#221).

サービス計画課 M

Removal of VR unit from Rear fixed-tube unit

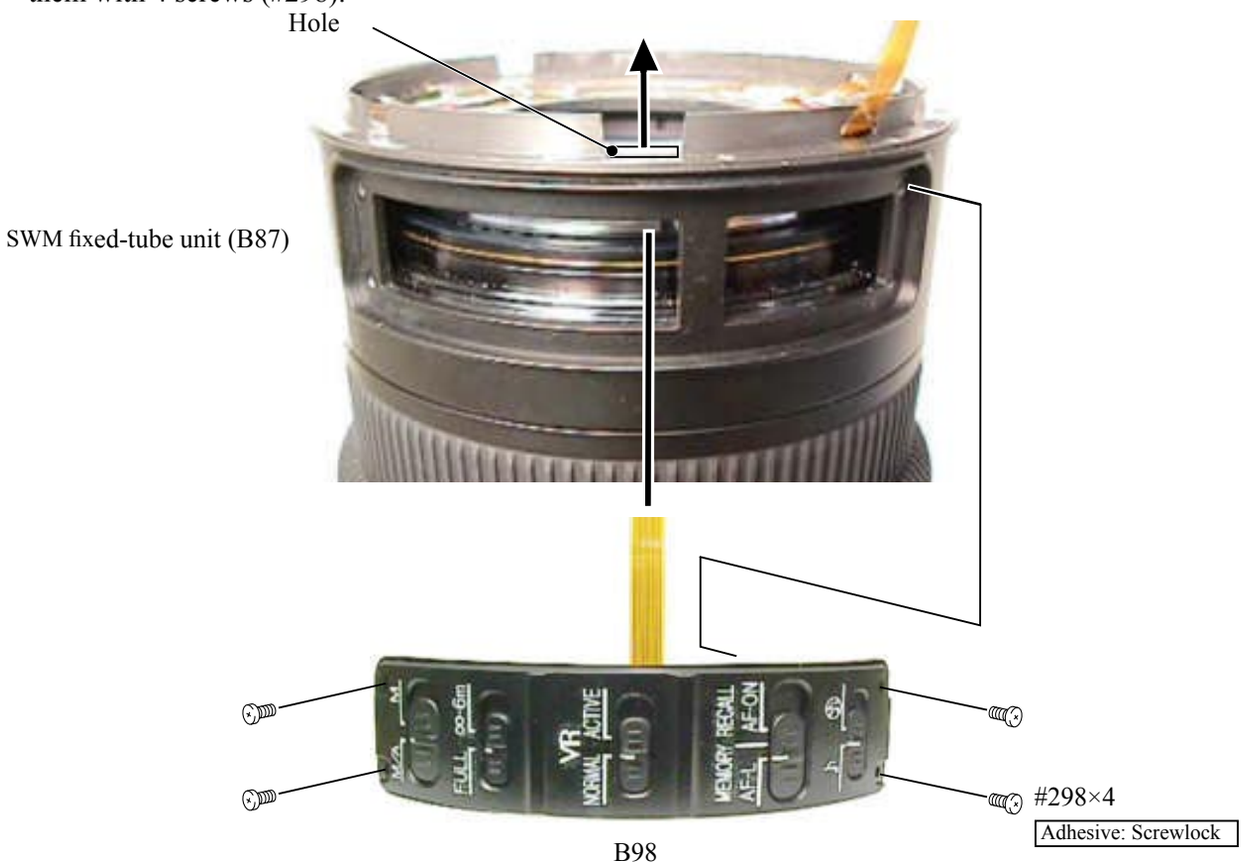
- After the adjustment, make a mark-off line. Then remove the temporarily attached 3 screws (#105) and detach the VR unit from the rear fixed-tube unit.



Note:
Do not put the unit with the aperture blade side down on a desk, etc, because it could cause a deformation of the aperture blade unit.

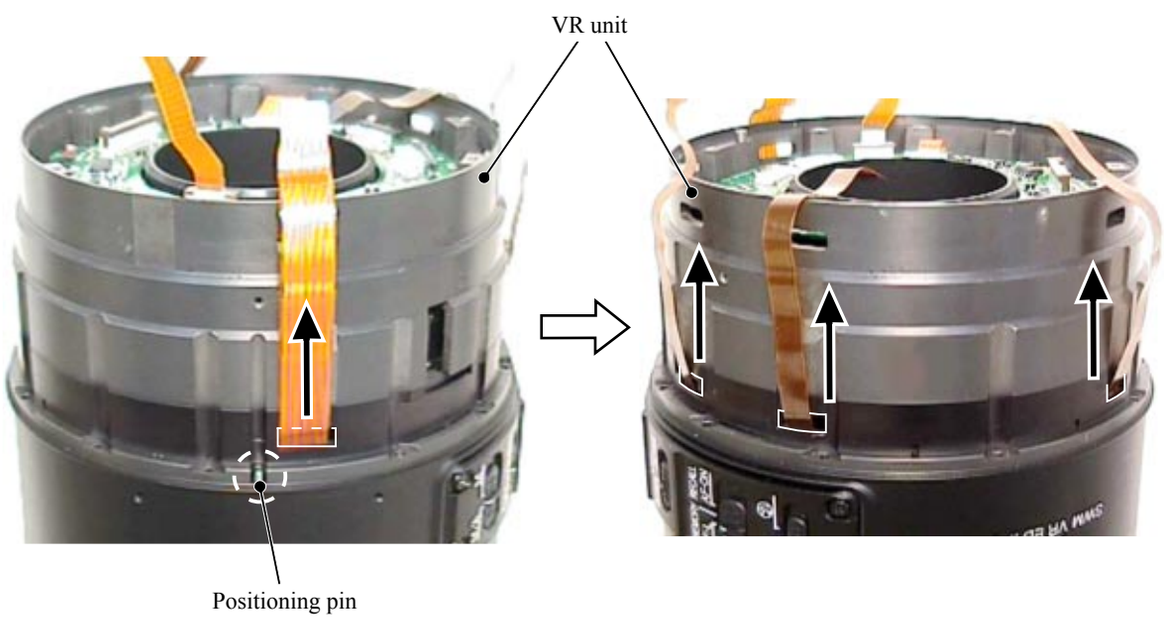
Change-SW unit

・Pass the FPC of the change-SW unit (B98) through the hole of the SWM fixed-tube unit (B87), and assemble them with 4 screws (#298).

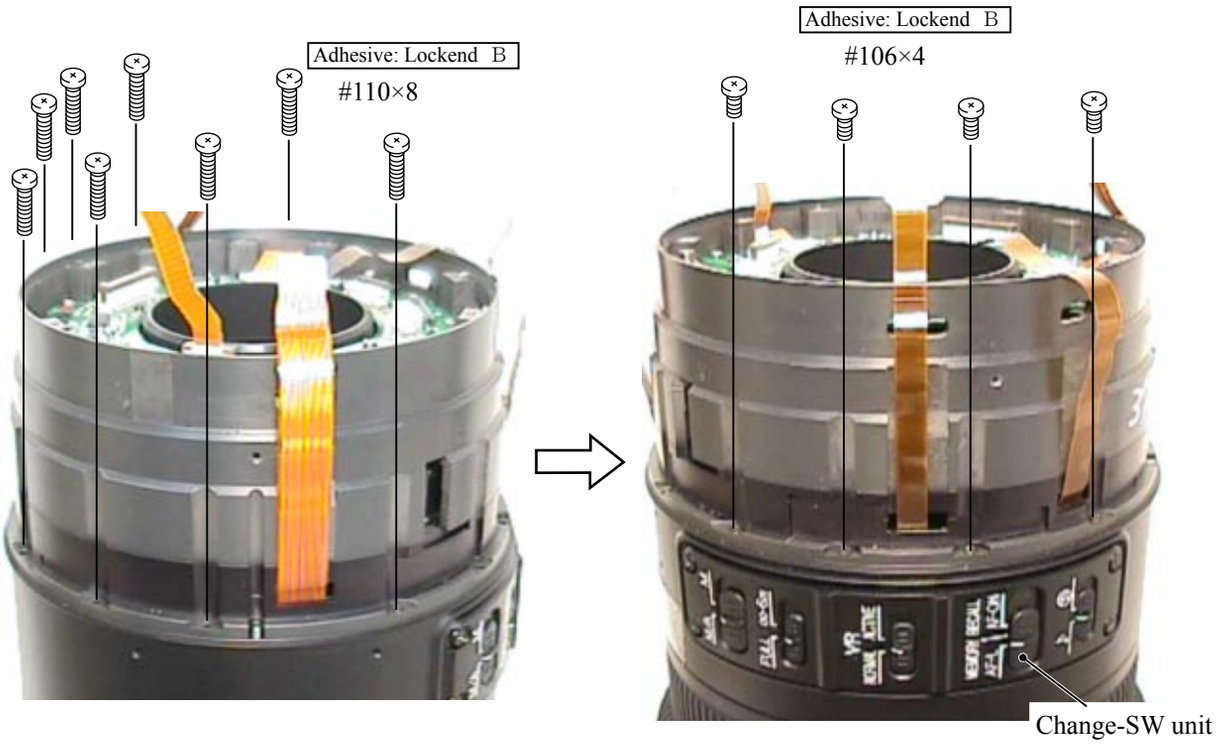


VR unit

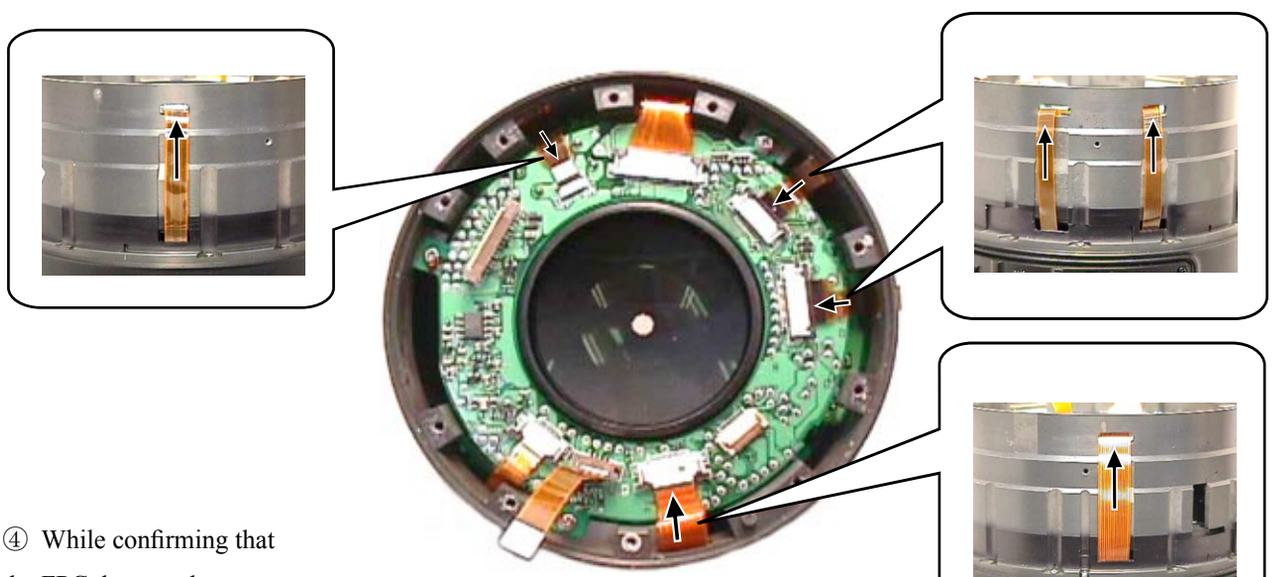
① Pass each FPC, which connects from the lens body, through holes of the VR unit to assemble them.



② Tighten 8 screws (#110) for VR unit, and 4 screws (#106) for the change-SW unit.



③ Pass each FPC through the holes of the VR unit, and connect them to each connector of the main PCB unit.

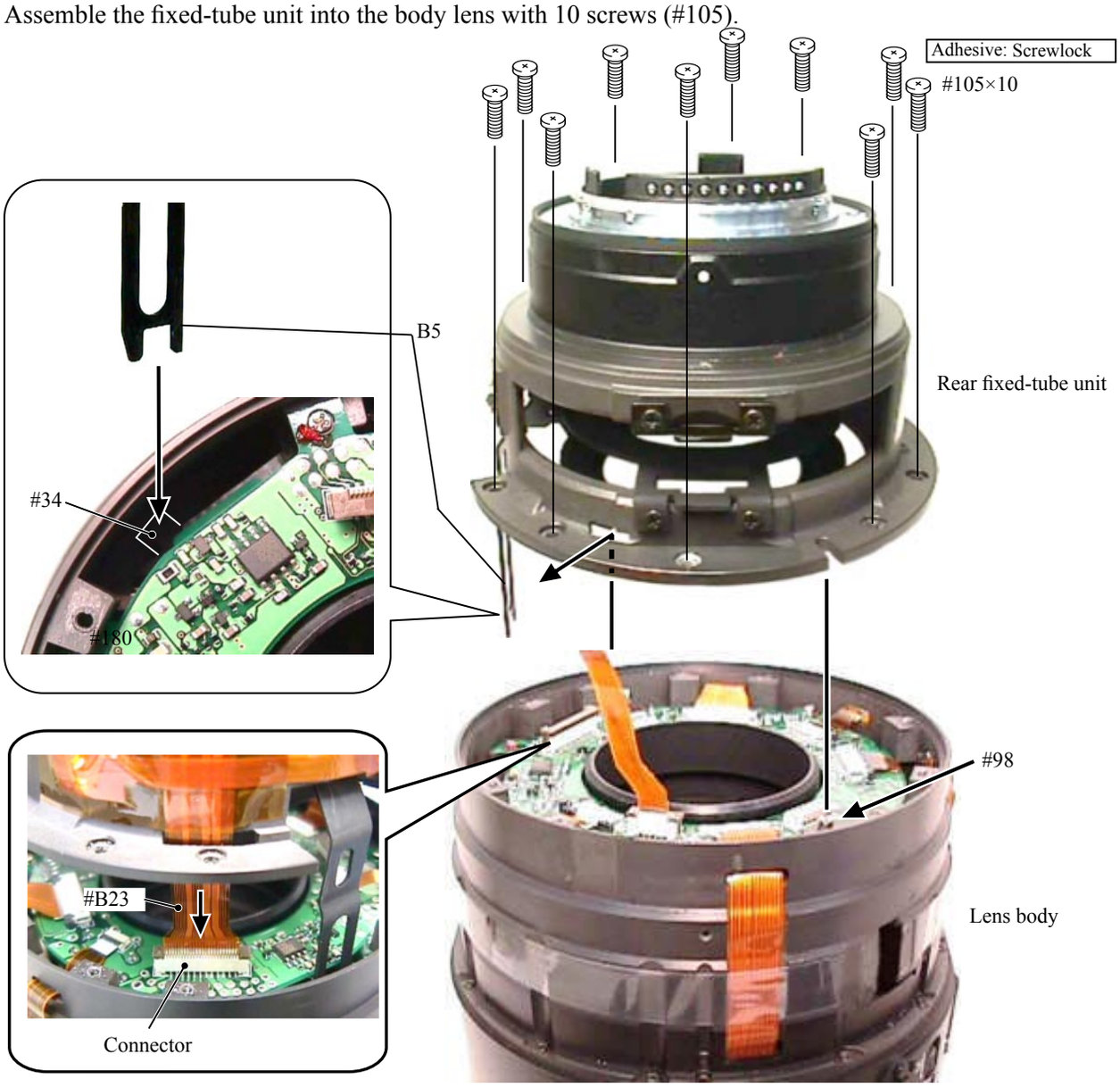


④ While confirming that the FPC does not become slackened, attach the polyester tape (TA-0001) on it.

Rear fixed-tube unit

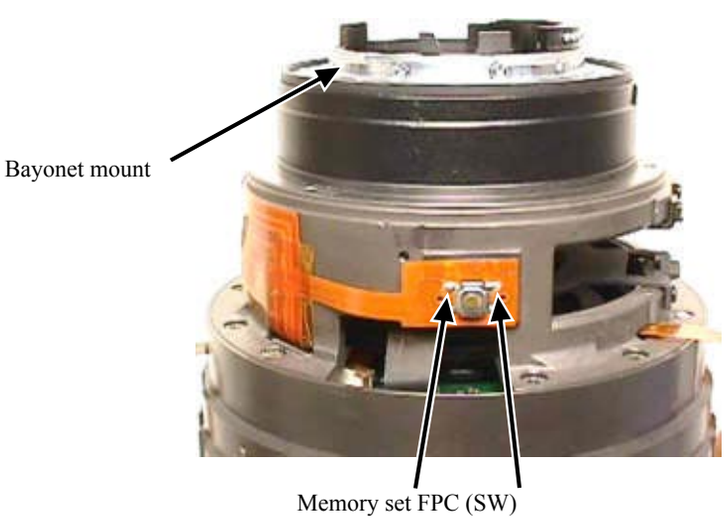
① Connect the FPC (B23) of the rear fixed-tube unit to the connector of the main FPC.

② Assemble the fixed-tube unit into the body lens with 10 screws (#105).



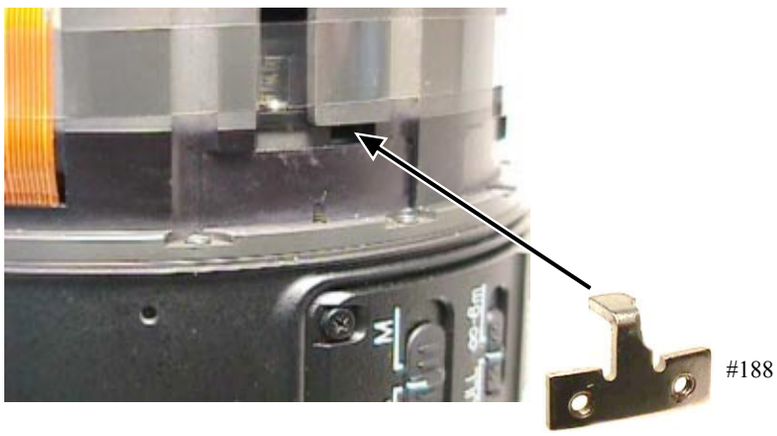
Electrical continuity check of GND line

・ Check the electrical continuity of GND line between the bayonet mount and the memory set FPC (SW).



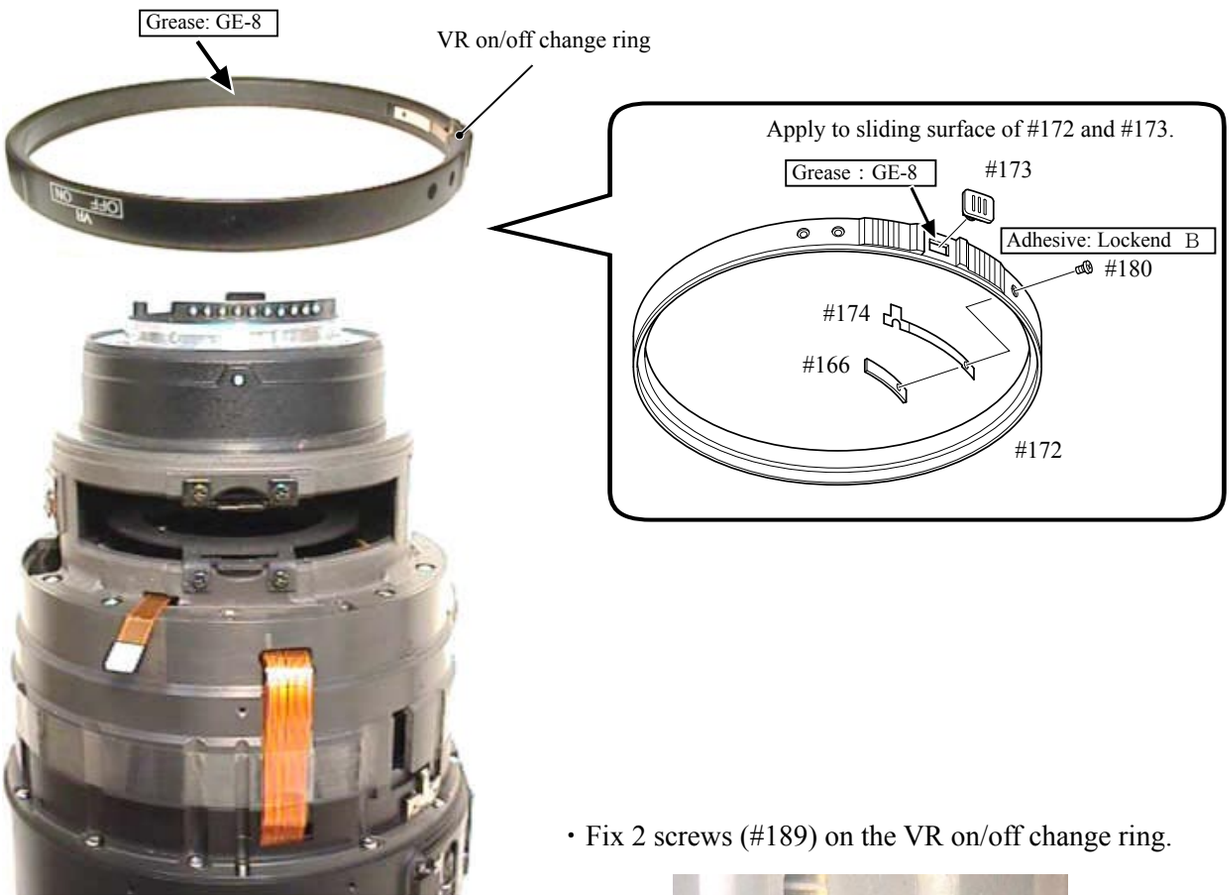
VR on/off change ring

・ Assemble the lock ring connecting key (#188) into the hole of the VR unit.



・ Assemble the VR on/off change ring.

Apply to the entire circumferential sliding surface of the inner diameter.

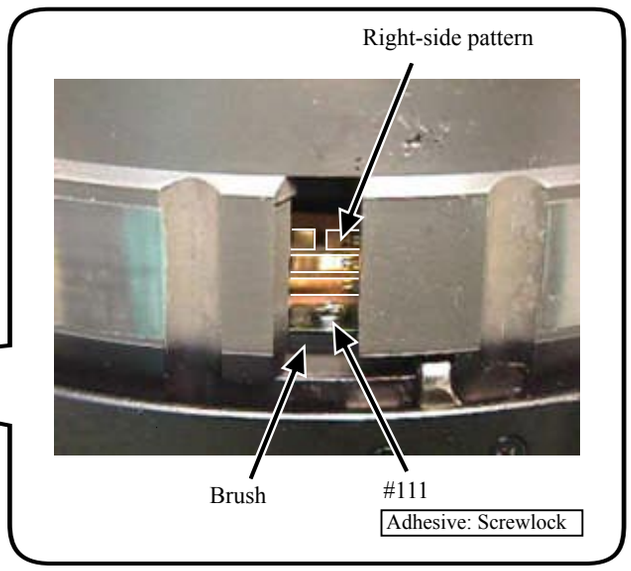


・ Fix 2 screws (#189) on the VR on/off change ring.

Position adjustment of VR-on/off brush

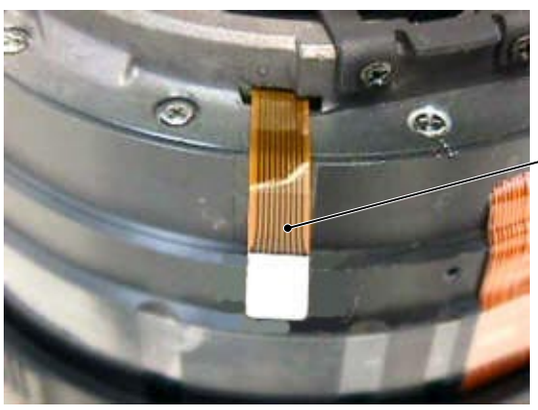
・ Check the VR-on/off and confirm that the brush is surely put on the right-side pattern of the PCB.

・ By moving the brush for adjustments and tighten the screw (#111).

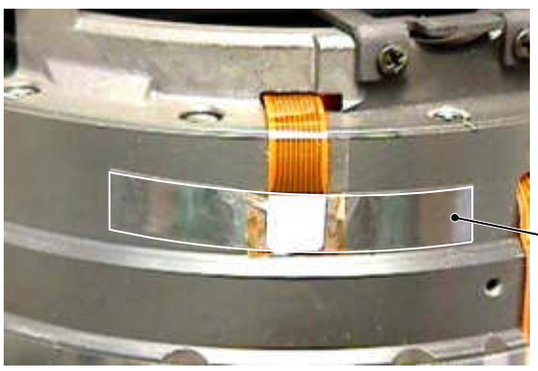


Fixation of FPC

・ Cut the polyester tape into appropriate size, then fix it on the FPC.

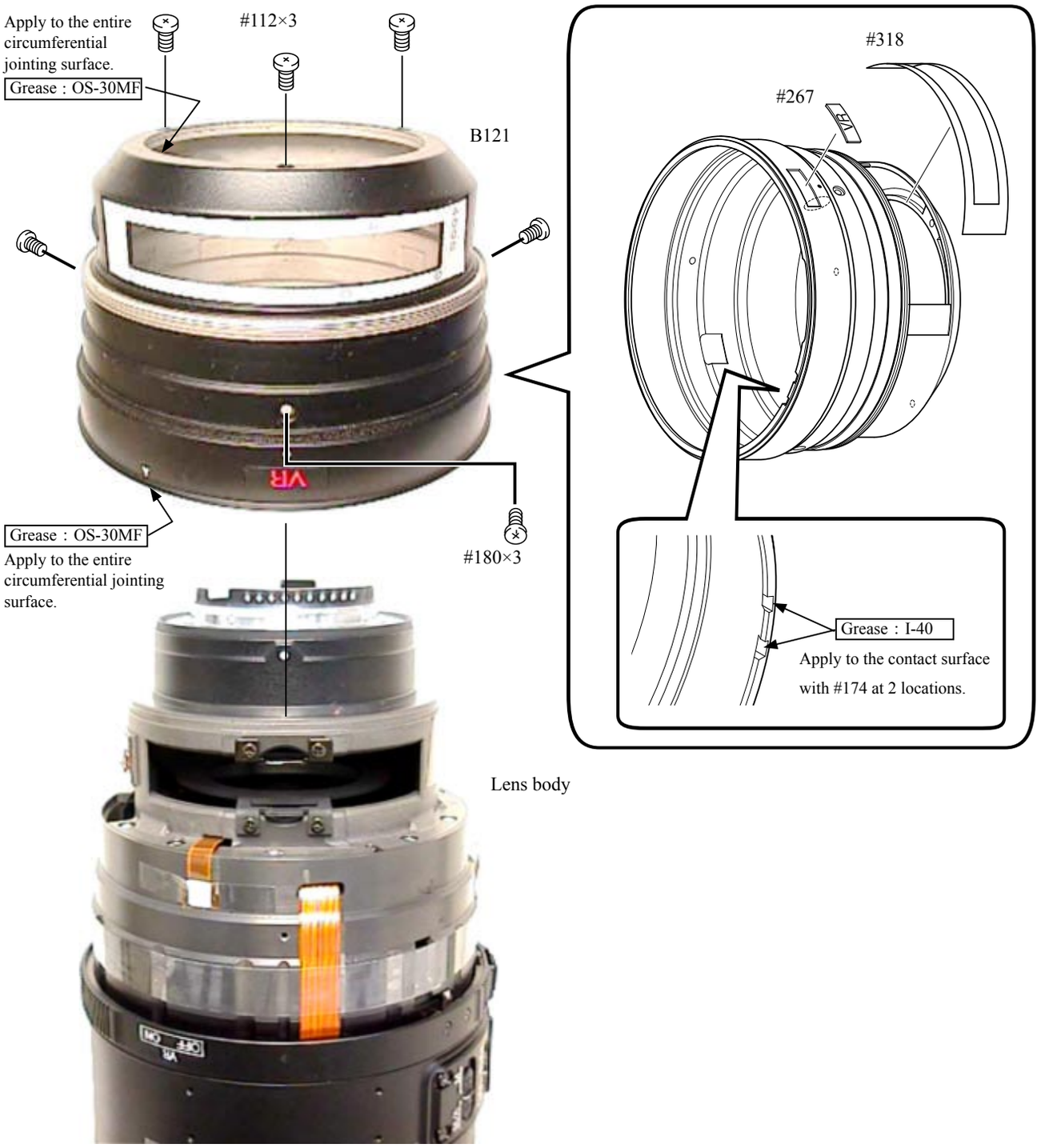


・ This FPC will be discontinued in the middle of mass production.

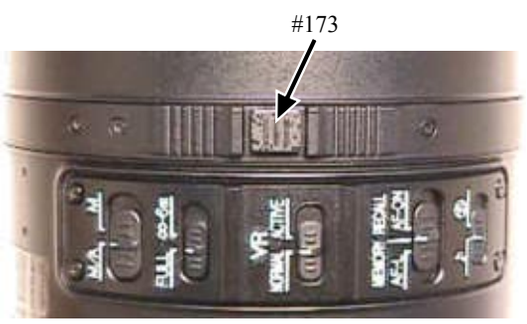


External fixed-tube unit

- Mount the external fixed-tube unit (B121) on the lens body, and fix them with 3 screws (#112) and 3 screws (#180).

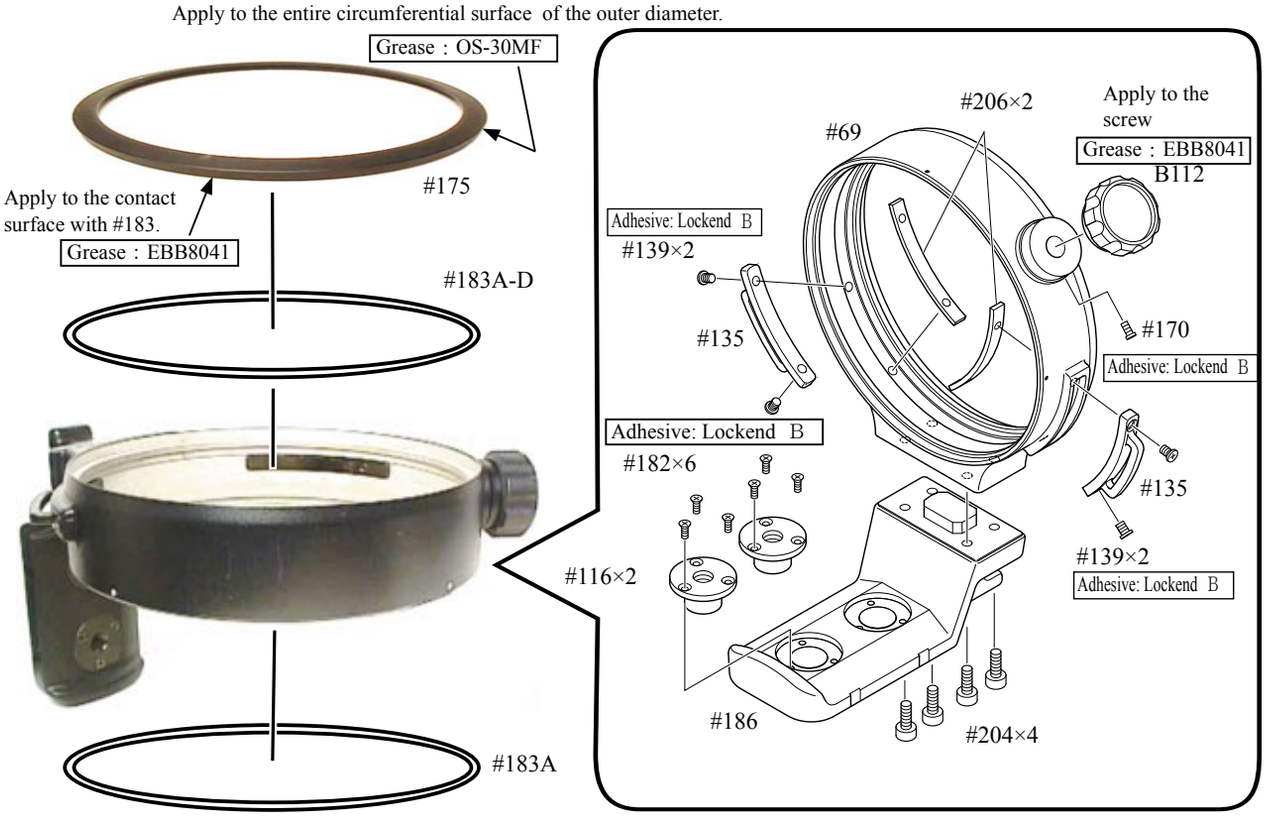


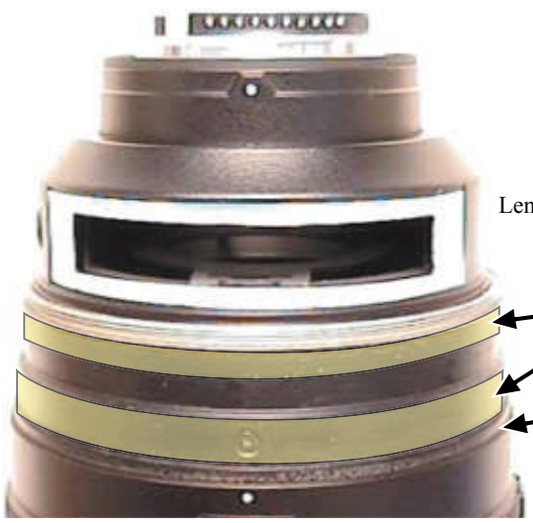
- Press the knob (#173) to check the rotation of the VR on/off change ring.



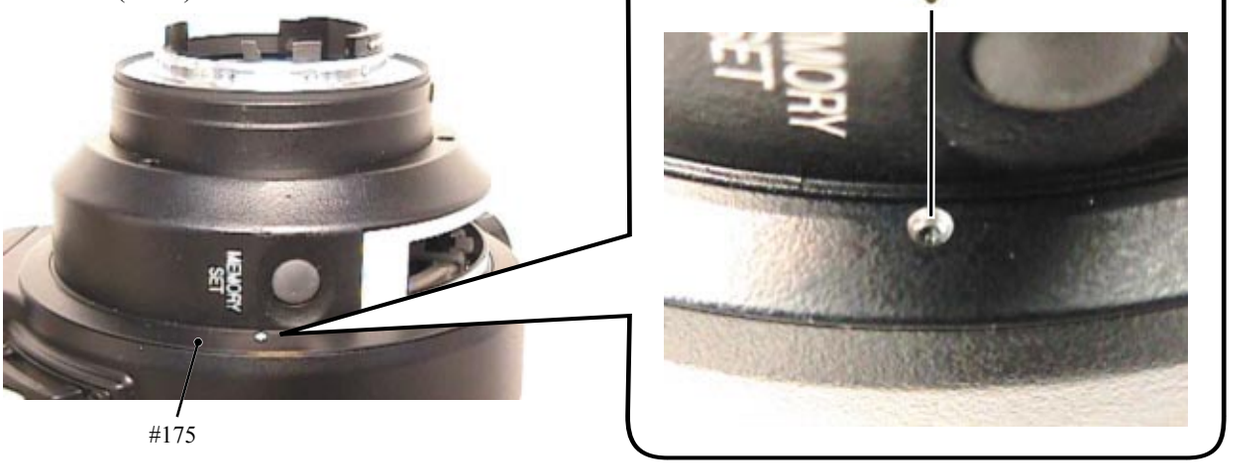
Tripod screw mount ring

Apply to the entire circumferential surface of the outer diameter.

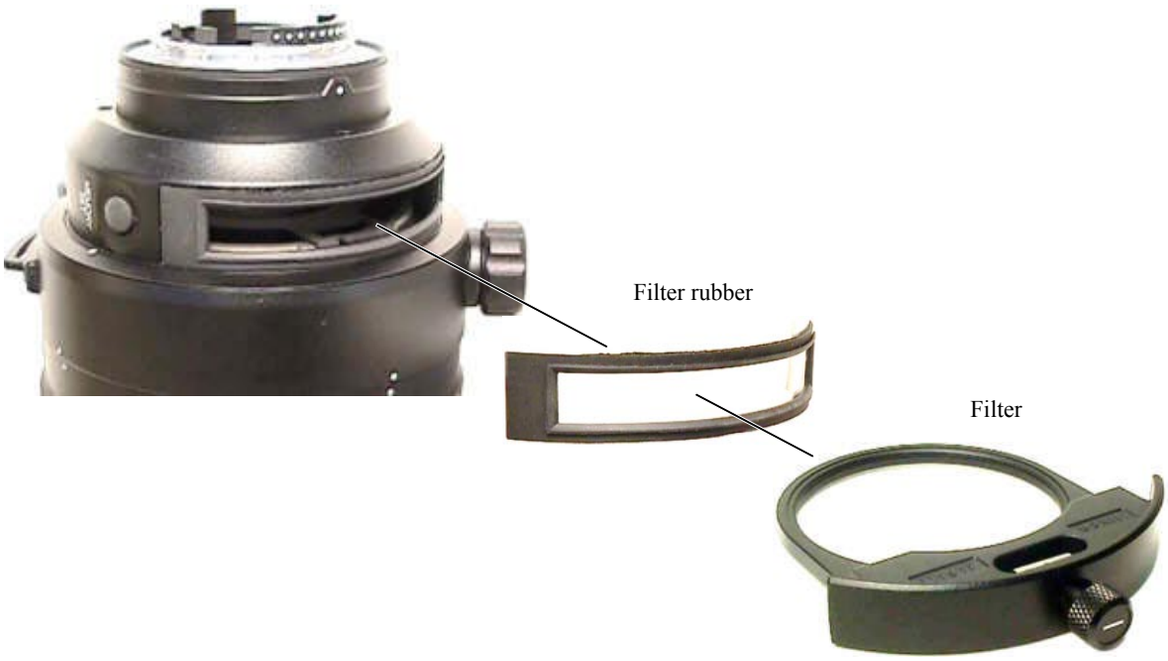



Lens body
Grease : EBB8041
Apply to the contact surface of the outer diameter at 2 locations.
Grease : OS-30MF
Apply to the entire circumferential surface, spreading approx. 2 mm wide.

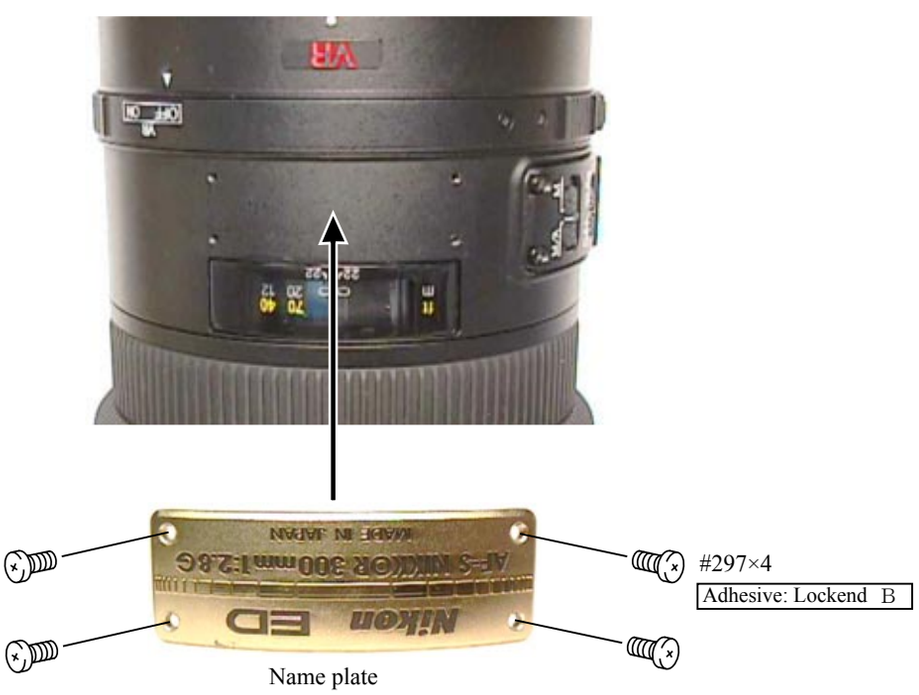
・ Fix the tripod retaining ring (#175) with the setscrew (#278).



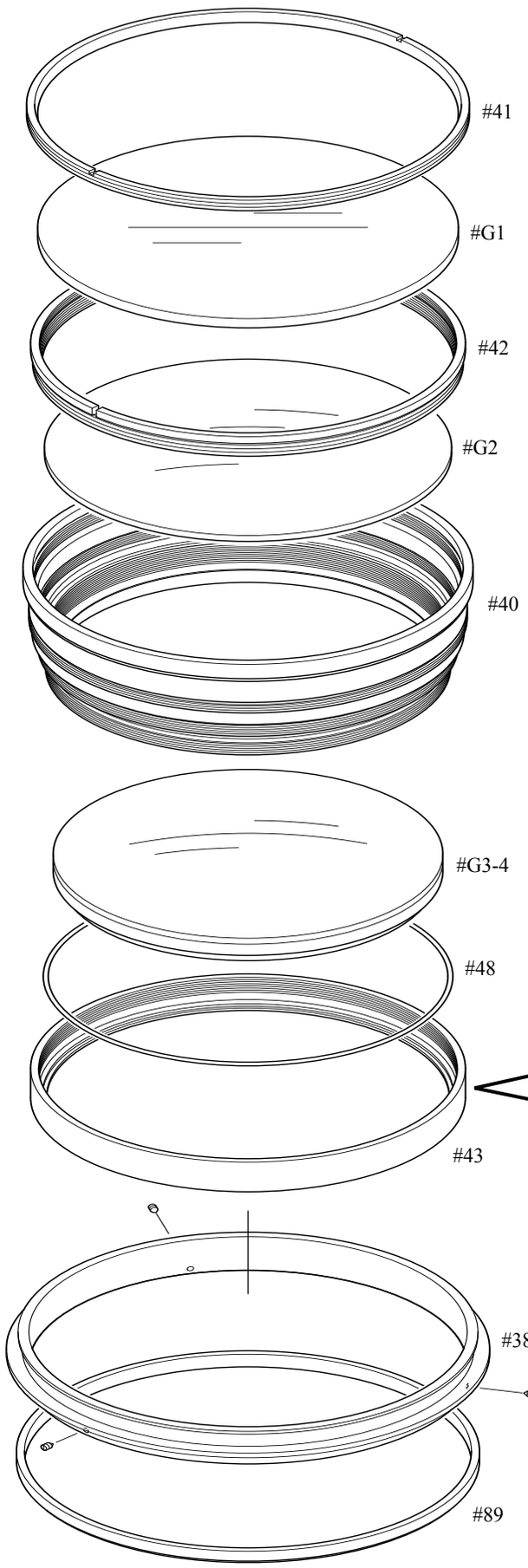
Filter rubber, Filter



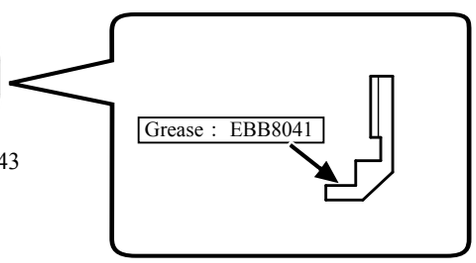
Name plate



1st lens group



Note:
When the vinyl electric wire (#48) is replaced, tighten the retaining ring (#43) once, then in a few minutes, retighten it.



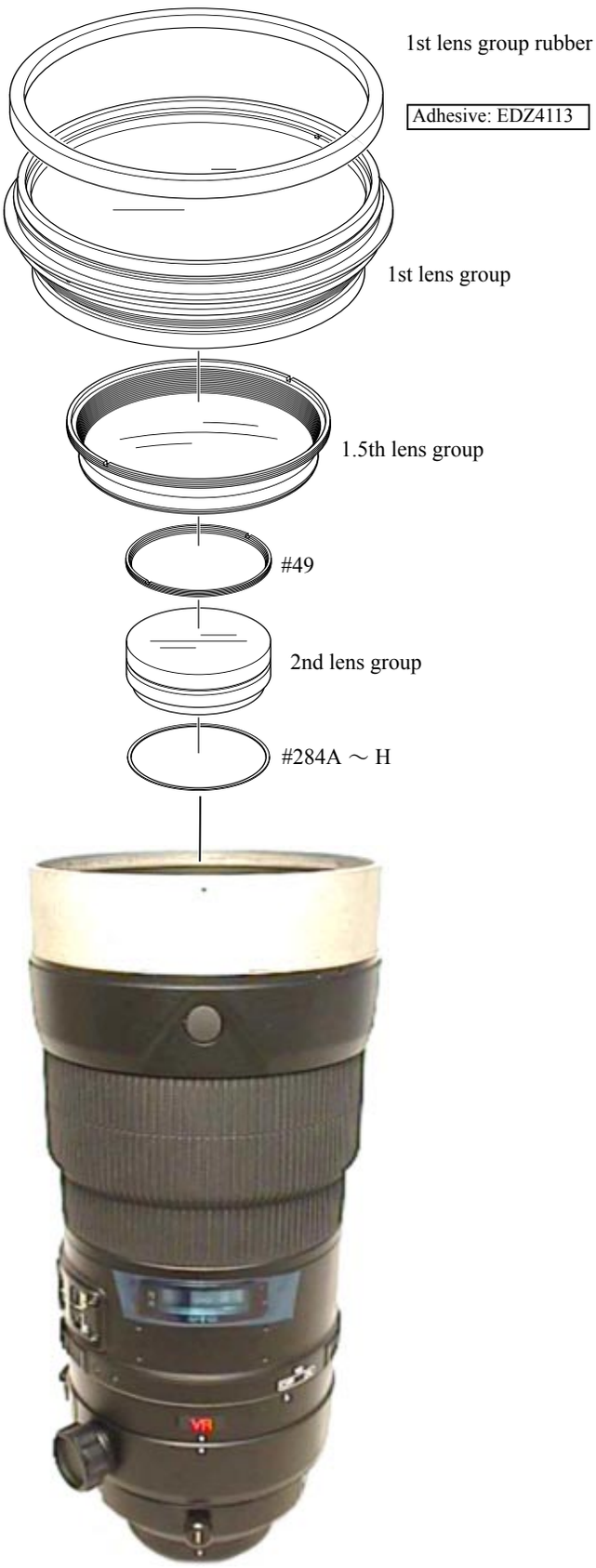
2nd lens group, 1.5th lens group, 1st lens group

① Set the focus ring by turning it all the way to the closest-distance.

② Put the washers (#284A-H) and fit the 2nd lens group into the lens body.

③ Put the retaining ring (#49) with a wrench (J11290), and fix the 2nd lens group.

④ Fit in the 1.5 lens group with a wrench (J11288).



FFD (Adjustment of back focus), ∞ alignment inspection and adjustment

① Set the focus ring by turning it to the infinity (∞).

② Insert a suitably-sized cut heavy paper or plastic, etc in the 3.1-aperture lever so that the aperture becomes "full".

③ Set the lens on the lens adapter for focus tester, and measure M.B.f value by the back focus collimator (J19002).

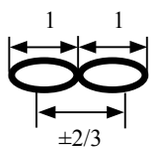
④ In case it is out of standard, remove the 1st lens group, 1.5th lens group, 2nd lens group, and washer (#284).

⑤ For a difference between the value (③) and the standard value, adjust the thickness by selecting the washers (#284A -H).

(If the difference is positive, increase the washers. If it is negative, decrease the washers.)

Standard: 0±0.25 mm

⑥ In case it is within standard, confirm the (∞) alignment by the collimator.



Standard: Center of (∞)-mark±2/3

Note: If the back focus collimator (J19002) is NOT available, while checking (∞) alignment by the collimator used in ⑥ , make adjustments by selecting the above washers.

1st lens group setscrew

Preparation for inspection & adjustment of main PCB

● In case of replacing the main PCB, SWM unit or MR encoder unit, be sure to make the necessary adjustments as follows:

1. Adjustments
   - Adjust the MR duty
   - Adjust the driving frequency and motor control (including Focus preset adjustment)

2. Equipment and tools to be required
   - Single output rated voltage power supply: 1 unit (6.0V 3.0A)
   - Oscilloscope: 1 unit For adjusting the MR duty, the driving frequency and motor control
   - AF-I communication box (J15306-1): 1 unit
   - AF-I communication adapter (J15307): 1 unit

● When the main PCB is replaced, be sure to perform “3. READING AND REWRITING OF EEPROM DATA” then “3. WRITING OF THE FIXED VALUES”.

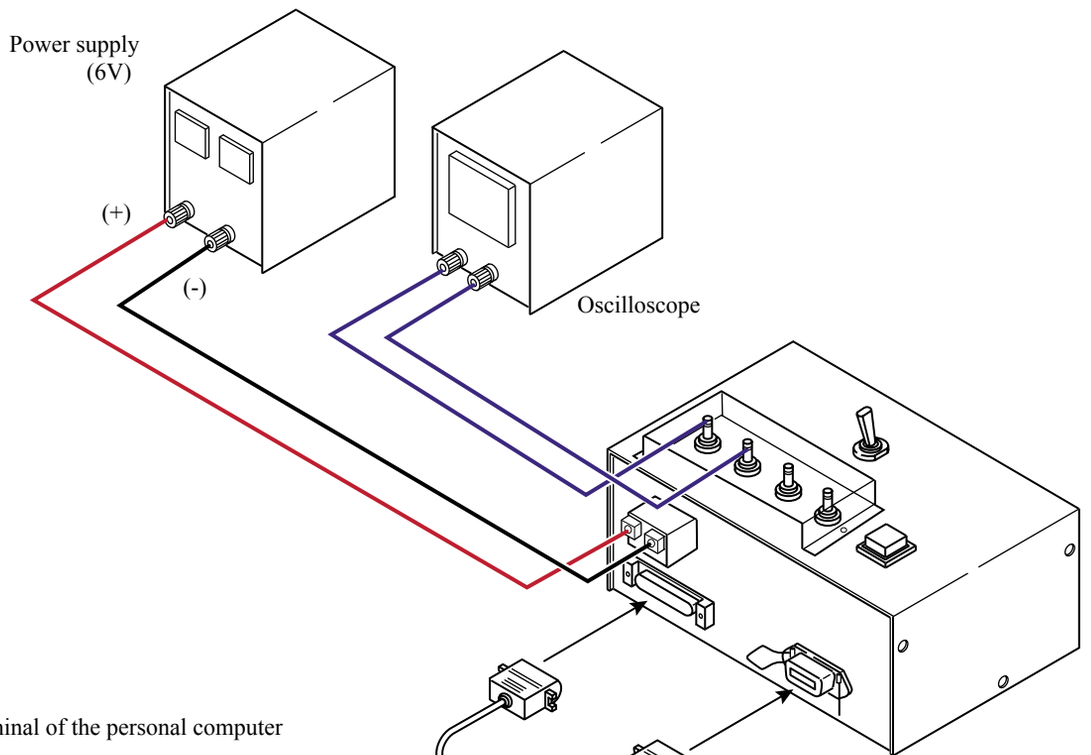
AF-S VR 300 inspection and adjustment program (J18378)

The below hardware requirements are necessary for installing the program on a computer.
Ensure them before installation.

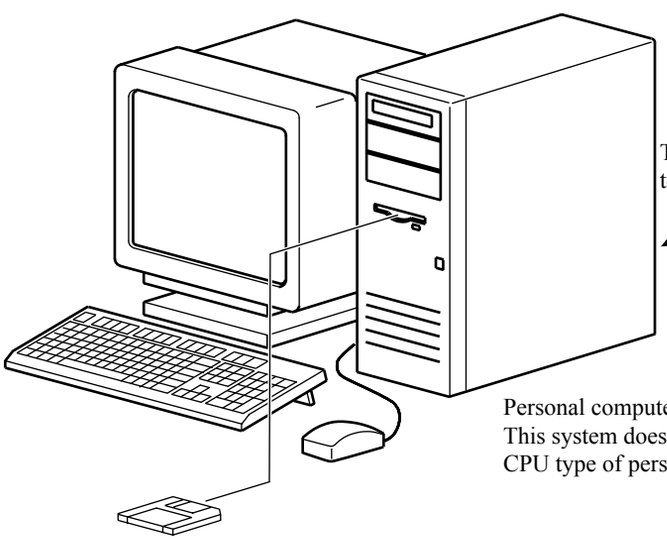
PC	IBM PC/AT compatible
OS	Windows XP Home Edition, Windows XP Professional, Windows 2000, Windows Millennium Edition (Me), Windows 98 Second Edition (SE), Windows 98,
CPU	Pentium Ⅱ 266MHz ～ Pentium Ⅳ 2GHz
RAM (Memory)	32MB or more
HD	6 MB-or-more free space is necessary when installation
Monitor resolution	800×600 or more pixels
Interface	Serial interface ※ USB interface cannot be used.

As long as the above requirements are met, either desktop or notebook PC is available.

【System configuration】



When the RS232C terminal of the personal computer is a 9-pin type, connect it by using the 25-pin/9-pin conversion connector. RJ does not supply this connector. Use products on the market.



To RS232C terminal

AF-I communication adapter
(J15307)

AF-S lens

Personal computer:
This system does not depend on the CPU type of personal computer.

AF-S VR 300
Inspection and adjustment software (J18378)

Adjustment of MR duty

●In case of replacing the main PCB, SWM unit and MR encoder unit, be sure to make adjustments.
●In case of replacing the main PCB, be sure to perform [3.READING AND REWRITING OF EEPROM DATA.] then [3.WRITING THE FIXED VALUES.]

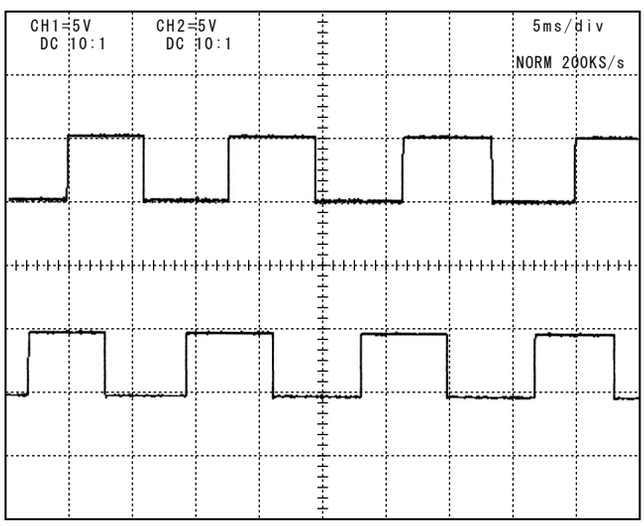
How to adjust

① Make sure that the electric current and voltage of the connected rated voltage power supply are set to the set values, which are instructed on the PC screen. Then, turn the rated voltage power supply ON.

② Select "1. MR DUTY ADJUSTMENT" in the menu of the AF-S VR300 inspection program.

③ The confirmation screen for writing the fixed values in EEPROM appears. Select the appropriate item.

④ Following the instruction on the screen, rotate the MF ring slowly by hand in the direction from the infinity to the close distance position. Make sure that the waveform on the oscilloscope has duty 50% and stop the MF ring at the close distance-end.



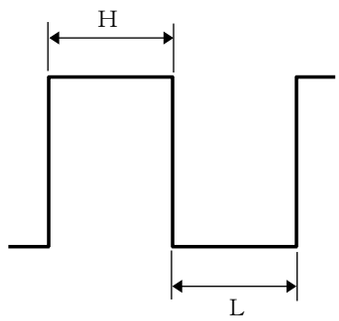
● Setting of oscilloscope

V/Div (CH1)	: 5V
V/Div (CH2)	: 5V
Coupling	: DC
Time/Div	: 5 m Sec
Trigger Mode	: NORMAL
Trigger Coupling	: DC
Trigger Source	: CH 1
Trigger Position	: +4 div
Trigger Type	: EDGE
Trigger Level	: 2.5 V

⑤ Following the instruction on the screen, rotate the MF ring slowly by hand in the direction from the close distance to the infinity position. Make sure that the waveform on the oscilloscope has duty 50% and stop the MF ring at the infinity-end.

Note : In case the waveform from infinity to close distance position or vice versa does not have duty 50%, repeat "INSPECTION AND ADJUSTMENT OF THE MR ENCODER OUTPUT WAVEFORM" on Page A5.

Sandard H : L = 100 : 150 ～ 150 : 100 (50% ±10.0%)



Adjustment of Driving frequency and Motor control

● In case of replacing the main PCB, SWM unit and MR encoder unit, be sure to make adjustments.

① The method of connection of the rated voltage power supply and measuring tools is the same as "ADJUSTMENT OF MR DUTY".

② Make sure that the electric current and voltage of the rated voltage power supply are set to the set values on the PC screen.

③ Turn the rated voltage power supply ON.

④ Select "2. ADJUSTMENT FOR DRIVING FREQUENCY & MOTOR CONTROL" in the menu of the AF-S VR300 inspection program. The lens automatically starts the driving of scanning.

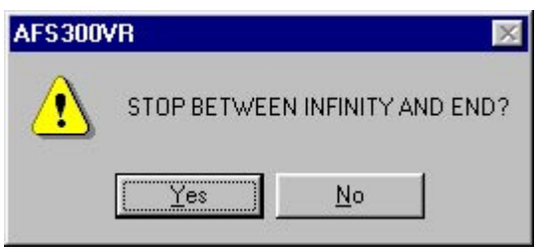


Fig.1

⑤ When the above Fig.1 is displayed, if the motor driving stops between the infinity and the end (exceeding the infinity), select "Yes" then go to the next "Focus preset adjustment".
In case the motor does not stop driving, select "No" to make adjustments again.
In case the motor does not stop driving even after the readjustments, adjust the MR duty again and repeat "ADJUSTMENT FOR DRIVING FREQUENCY & MOTOR CONTROL".
If the adjustment is not successful in spite of the above, the SWM unit, fix-tube unit, or MR head unit may be defective.

⑥ When the above "Fig.1" is displayed in "Focus preset adjustment", select "Yes " to complete the adjustment.
In case the motor does not stop driving, select "No " to make adjustments again.
In case the motor does not stop driving even after the readjustments, adjust the MR duty again and repeat "ADJUSTMENT FOR DRIVING FREQUENCY & MOTOR CONTROL".
If the adjustment is not successful in spite of the above, the SWM unit, fix-tube unit, or MR head unit may be defective.

Inspection of Lens operations

Check the lens operations by using a personal computer after assembling.

○ Check by personal computer

● Check by the following considerations:

1. MR encoder operations

・Drive the scanning of lens and check the total number of pulses.

・In case the MR head of the MR encoder and the magnetic tape are misaligned, the number of pulses becomes out of standard.

2. Lens-servo stop accuracy

・Check the number of overrun/underrun pulses (deviation of the stop position from the target position) per the specified lens driving.

・In case the irregularity of mechanical operations does not take place in the focus ring driving unit, the underrun tends to occur if it is heavy in the cam ring rotation of the MR encoder, while the overrun tends to occur if it is light in its rotation of the MR encoder.

3. Lens-servo time

・Check the servo time (from starting and stopping the servo) when driving the specified lens by using the oscilloscope.

・In case the irregularity of mechanical operations does not take place in the focus ring driving unit, the servo-time tends to be long if it is heavy in the cam ring rotation of the MR encoder, while the servo-time tends to be short if it is light in its rotation of the MR encoder.

4. Switches and lenses

・Check the ON/OFF operations of switches and the operating condition of the distance encoder.

● After inspections

1. When the MR encoder operations are not up to the standard:
   Readjust the MR duty. (ref. Page A39.)
   In case the pulse is not up to the standard, adjust the output waveform of the MR encoder again. (ref. Page A3.)
   In case the pulse meets the standard, replace the cam ring unit.

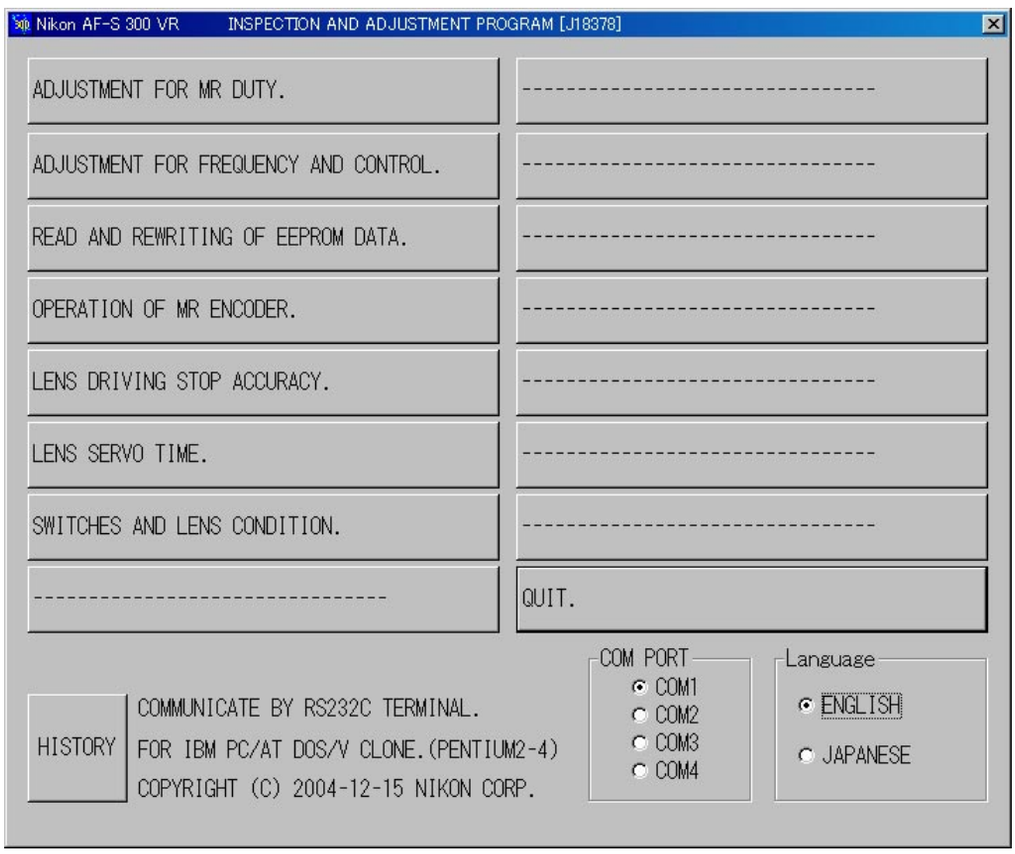
2. When the lens-servo stop accuracy is not up to the standard:
   Check the output waveform of the MR encoder. If it is normal, replace the fix-tube unit.

3. When the lens-servo time is not up to the standard:
   Readjust the driving frequency and motor control.
   In case the lens-servo time is not up to the standard even after the readjustment, replace the fix-tube unit.

4. When switches do not work properly:
   Check the wiring state of the troubled switch or replace it.

●AF-S 300 VR inspection program

(1) Menu screen



・Menu items

The items 1 and 2 are used for adjustments.

The item 3 is used for reading and writing EEPROM DATA.

The items 4~7 are used for inspections.

・Selection items

After selecting items screens appear, such as the lens selection, the focal length selection, the voltage setting, the inspection mode start.

The screens depend on the items. Follow the instructions of the personal computer.

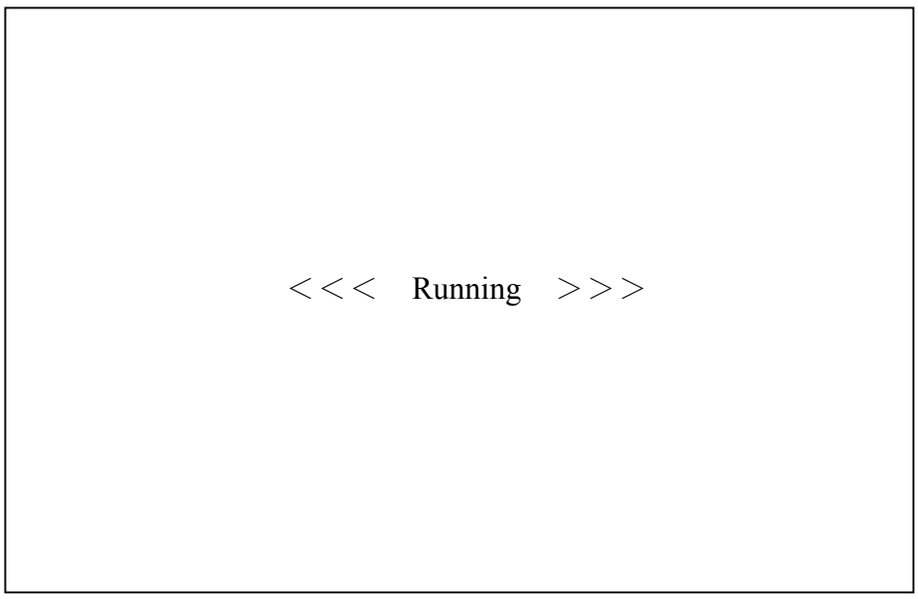
・Operating voltage

	Power supply for AF motor inside lens	Power supply for AF-I communication box
Inspection of MR encoder operation	6.0 ± 0.1 V	5.5± 0.2 V
Inspection of lens-servo stop accuracy	6.5 ± 0.1 V	
Inspection of lens-servo time	6.5± 0.1 V	
Inspection of switches and lenses	6.0 ± 0.1V	

・Initial driving

Drive scanning several times and stop at infinity-end.

(2) Inspection of MR encoder operations



Caution : If the MF ring is rotated while the lens scanning is driven, the pulse shows an abnormal value.
Do NOT touch the MF ring during operations.
Make inspections at the 5 positions as below.

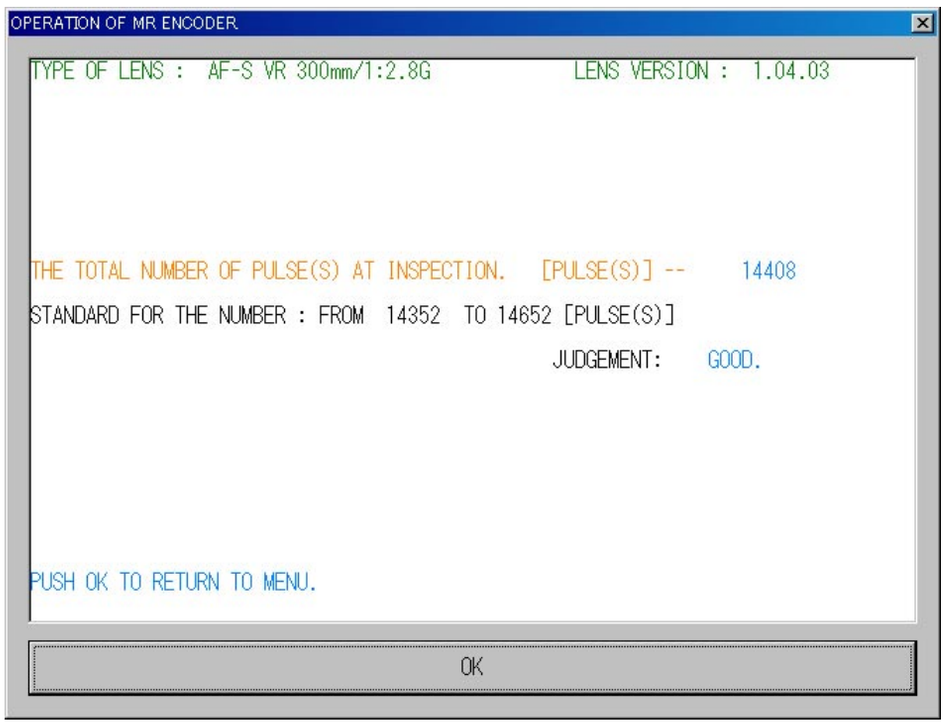
(Lens position in inspecting)

Lens inclination	Position of index window
Horizontal	Up, right and left
Front lens group 90° upward	
Front lens group 90° downward	

When the inspection ends, the result of the next page appears.

The difference in pulse before and after the inspection must be within the standard.

< Standard > Total pulses : 14502 ± 150 PLUSE(S)


OPERATION OF MR ENCODER
TYPE OF LENS : AF-S VR 300mm/1:2.8G
LENS VERSION : 1.04.03
THE TOTAL NUMBER OF PULSE(S) AT INSPECTION. [PULSE(S)] -- 14408
STANDARD FOR THE NUMBER : FROM 14352 TO 14652 [PULSE(S)]
JUDGEMENT: GOOD.
PUSH OK TO RETURN TO MENU.
OK

(3) Inspection of lens-servo stop accuracy

If the lens stops while inspecting the lens-servo stop accuracy, select "2. ADJUST DELAY-TIME" of the below Fig.2, and input a figure between 0-1000 for the delay time (msec: millisecond) which prevents stopping the lens.

Note:
The value of "ADUST DELAY-TIME" is set by the adjustment software. So, if the lens does not stop during the inspection of "LENS DRIVING STOP ACCURACY", any value can be input without problem.
However, the larger the value of "ADJUST DELAY-TIME" gets, the longer the inspection time becomes.

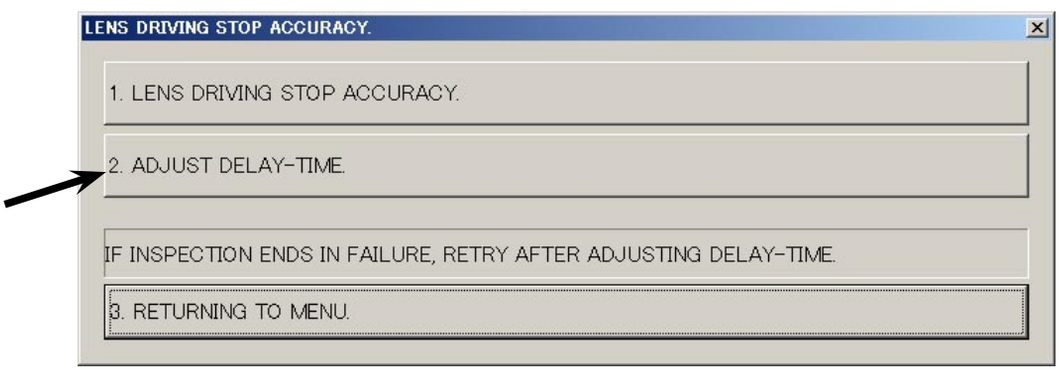
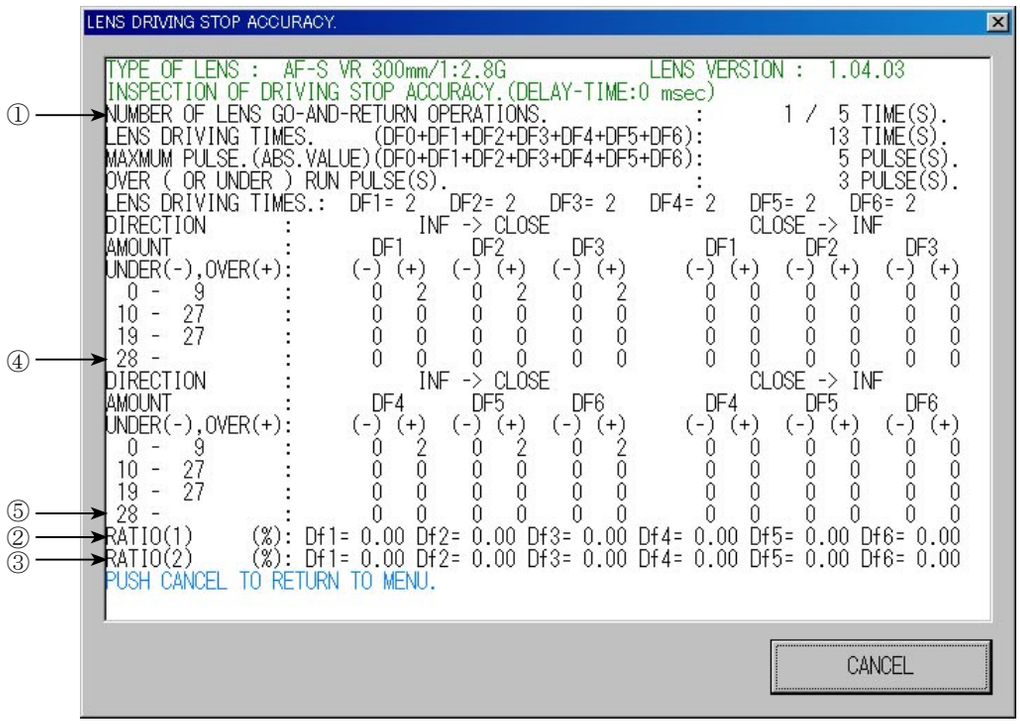

LENS DRIVING STOP ACCURACY.
1. LENS DRIVING STOP ACCURACY.
2. ADJUST DELAY-TIME.
IF INSPECTION ENDS IN FAILURE, RETRY AFTER ADJUSTING DELAY-TIME.
3. RETURNING TO MENU.

Fig.2


LENS DRIVING STOP ACCURACY.
TYPE OF LENS : AF-S VR 300mm/1:2.8G LENS VERSION : 1.04.03
INSPECTION OF DRIVING STOP ACCURACY.(DELAY-TIME:0 msec)
①
NUMBER OF LENS GO-AND-RETURN OPERATIONS. : 1 / 5 TIME(S).
LENS DRIVING TIMES. (DF0+DF1+DF2+DF3+DF4+DF5+DF6): 13 TIME(S).
MAXMUM PULSE.(ABS.VALUE)(DF0+DF1+DF2+DF3+DF4+DF5+DF6): 5 PULSE(S).
OVER (OR UNDER) RUN PULSE(S). : 3 PULSE(S).
LENS DRIVING TIMES.: DF1= 2 DF2= 2 DF3= 2 DF4= 2 DF5= 2 DF6= 2
DIRECTION : INF -> CLOSE CLOSE -> INF
AMOUNT : DF1 DF2 DF3 DF1 DF2 DF3
UNDER(-),OVER(+): (-) (+) (-) (+) (-) (+) (-) (+) (-) (+) (-) (+)
0 - 9 : 0 2 0 2 0 2 0 0 0 0 0 0
10 - 27 : 0 0 0 0 0 0 0 0 0 0 0 0
19 - 27 : 0 0 0 0 0 0 0 0 0 0 0 0
④
28 - : 0 0 0 0 0 0 0 0 0 0 0 0
DIRECTION : INF -> CLOSE CLOSE -> INF
AMOUNT : DF4 DF5 DF6 DF4 DF5 DF6
UNDER(-),OVER(+): (-) (+) (-) (+) (-) (+) (-) (+) (-) (+) (-) (+)
0 - 9 : 0 2 0 2 0 2 0 0 0 0 0 0
10 - 27 : 0 0 0 0 0 0 0 0 0 0 0 0
19 - 27 : 0 0 0 0 0 0 0 0 0 0 0 0
⑤
28 - : 0 0 0 0 0 0 0 0 0 0 0 0
②
RATIO(1) (%): Df1= 0.00 Df2= 0.00 Df3= 0.00 Df4= 0.00 Df5= 0.00 Df6= 0.00
③
RATIO(2) (%): Df1= 0.00 Df2= 0.00 Df3= 0.00 Df4= 0.00 Df5= 0.00 Df6= 0.00
PUSH CANCEL TO RETURN TO MENU.
CANCEL

Caution : If the MF ring is rotated while the lens scanning is driven, the pulse shows an abnormal value. Do NOT touch the MF ring during operations.

During the lens driving, the above screen is displayed. Make inspections at the 5 positions as below.

(Lens position in inspecting)

Lens inclination	Position of index window
Horizontal	Up, right and left
Front lens group 90° upward	
Front lens group 90° downward	

The number of overrun/underrun pulses must be within the standards after the 5 lens back-and forth driving motions ("5/5TIME (S)." in [1] of the display).

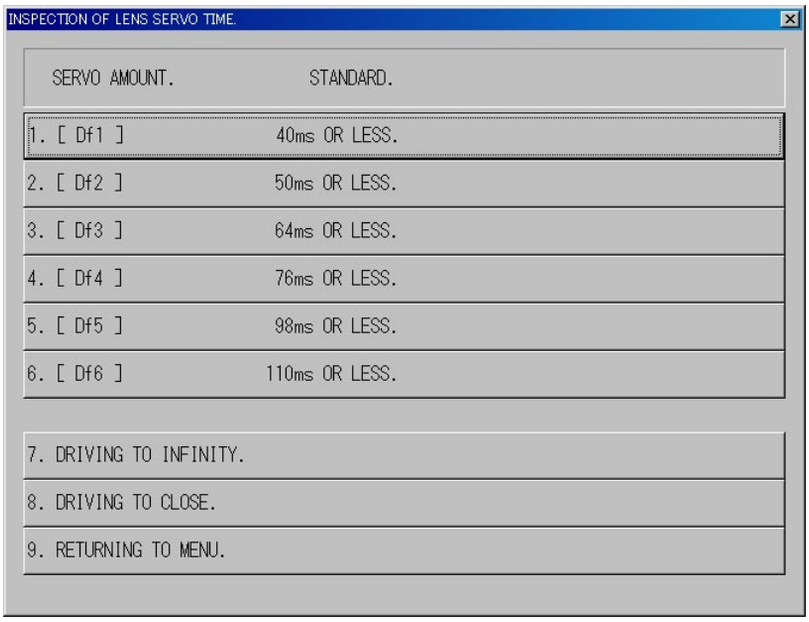
Standard RATIO (1) is 40% or less for Df1~Df6. ② of the screen
(Occurrence ratio of 10~27 pulses)

RATIO (2) is 10% or less for Df1~Df6. ③ of the screen
(Occurrence ratio of 19~27 pulses)

Occurrence of 28 or more pulses is zero for Df1~Df6. ④ and ⑤ of the screen
(Only one occurrence indicates malfunction.)

※ "Df1~Df6" shows the lens driving amount.

(4) Inspection of lens-servo time

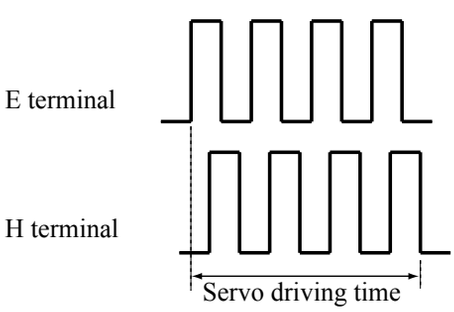

INSPECTION OF LENS SERVO TIME.
SERVO AMOUNT. STANDARD.
1. [Df1] 40ms OR LESS.
2. [Df2] 50ms OR LESS.
3. [Df3] 64ms OR LESS.
4. [Df4] 76ms OR LESS.
5. [Df5] 98ms OR LESS.
6. [Df6] 110ms OR LESS.
7. DRIVING TO INFINITY.
8. DRIVING TO CLOSE.
9. RETURNING TO MENU.

Connect the probes of oscilloscope to E and H terminals of the AF-I communication box (J15306). Select the servo driving amount respectively. Each lens-servo drive time must be within the standard.

Caution : If the MF ring is rotated during inspections, the waveform shows an abnormal value. Do NOT touch the MF ring during inspections. Make inspections at the 5 positions as below.

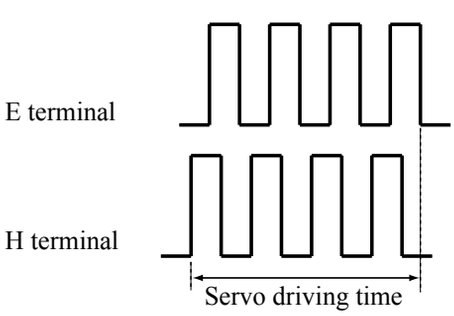
(Lens position in inspecting)

Lens inclination	Position of index window
Horizontal	Up, right and left
Front lens group 90° upward	
Front lens group 90° downward	



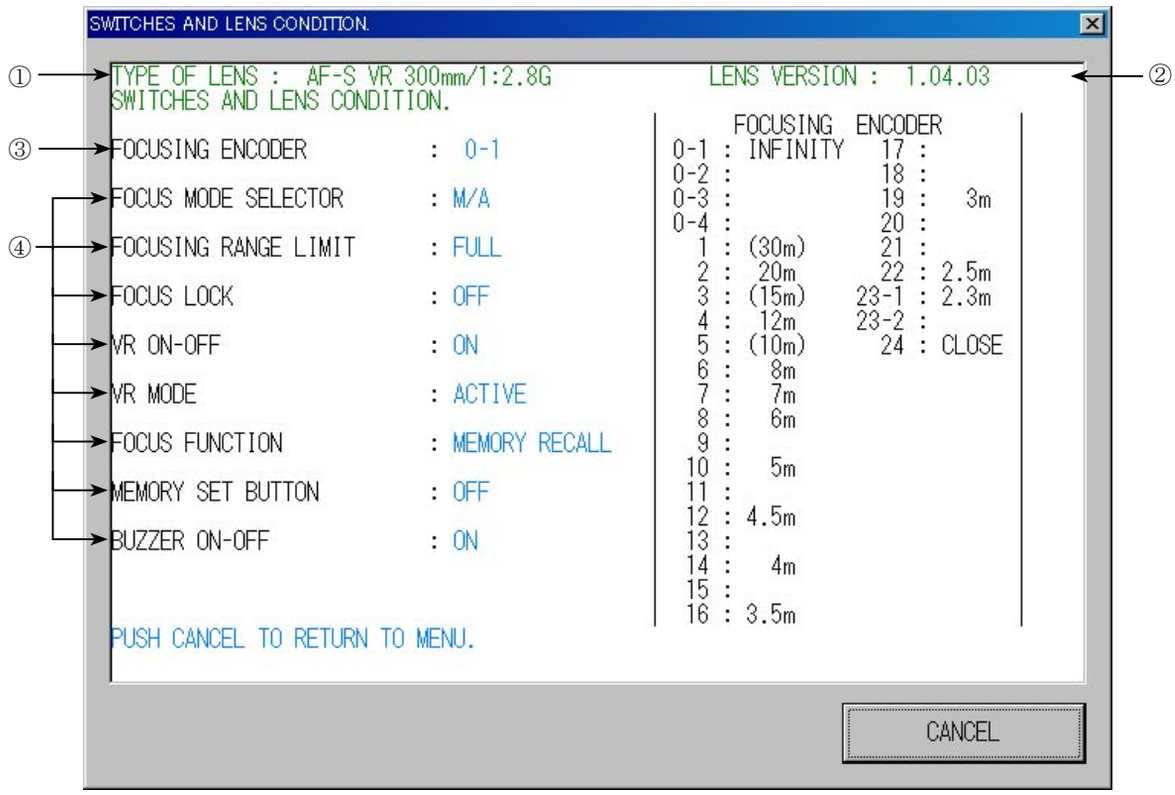
●Oscilloscope setting

V/Div	: 5V
Coupling	: DC
Time/Div	: 20 m Sec
Trigger Mode	: SGL (S)
Trigger Coupling	: DC
Trigger Source	: CH1



※ The waveforms of E and H terminals have the forms for going up for start and going down for start.

(5) Inspection of switches and lens conditions



① Type of lens.

② The version of CPU in the lens.

③ The signals of the focusing encoder and zooming encoder.

The value changes by turning the MF ring with M or M/A of the lens driving mode selector.

④ The status of Switches

Necessary adjustment when replacing parts

Adjustments / Parts to be replaced	Adjustment for MR duty (Necessary to write fixed value); driving frequency; motor control	Inspection & adjustment for MR encoder operations; lens-servo stop accuracy; lens-servo time; switches; lens condition	VR adjustment
Main PCB unit	○	○	○
SWM unit	○	○	
VR unit		○	○
Jyro unit		○	○
GMR unit	○	○	
Fix-tube unit	○	○	

VR adjustment

When making the VR adjustment, refer to the "Instruction Manual" that is attached to the VR lens adjustment equipment (J15380).

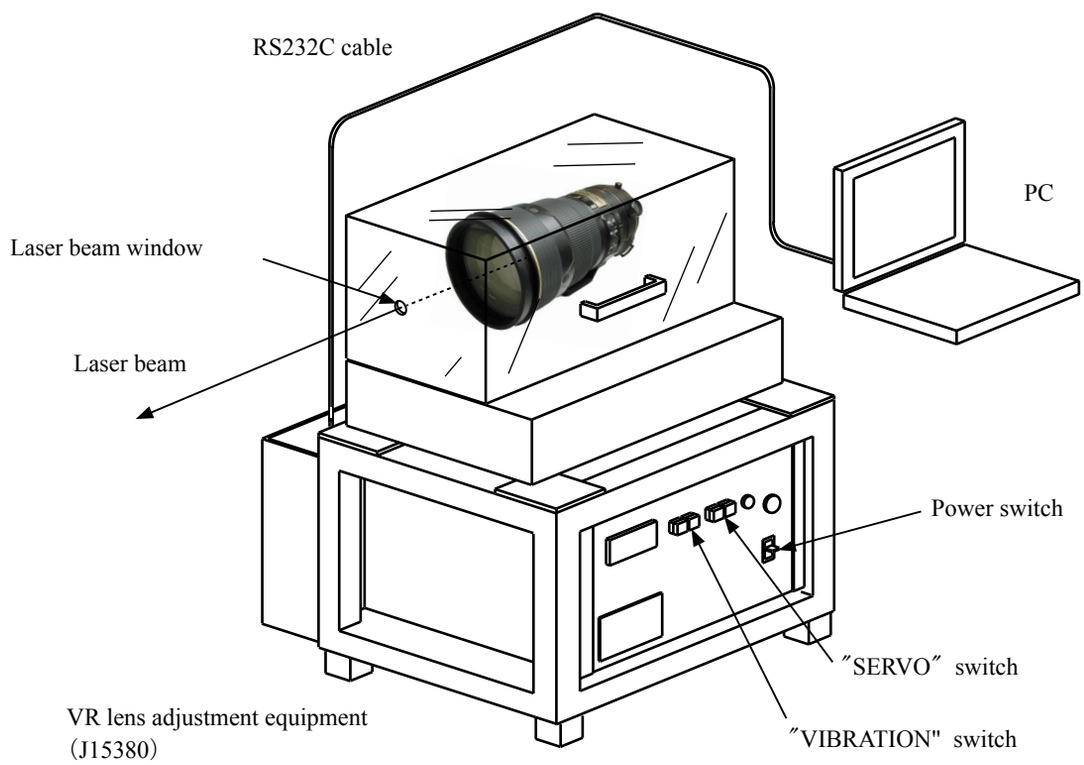
⚠ WARNING	
	●This equipment uses the laser beam. Do not look at the laser beam directly or through the laser beam window.

Preparation

① Set up the VR lens adjustment equipment (J15380) as shown below.

② Connect the personal computer to the equipment and start the PC.

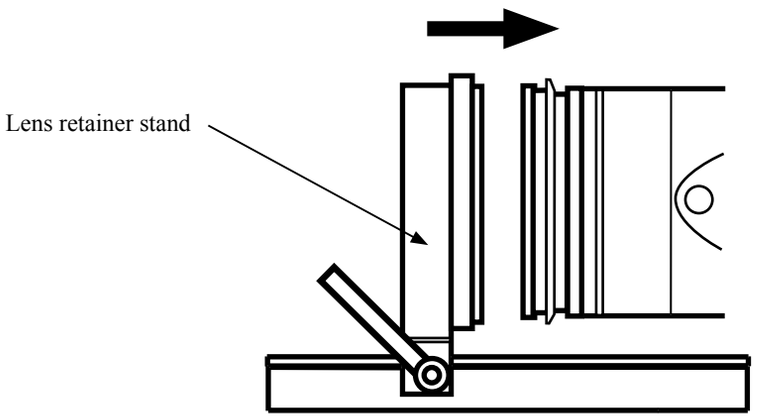
③ Mount the lens on the equipment. Set the infinity (∞) mark of the focus ring to the index.
Refer to the next page for "Procedure for mounting the lens".



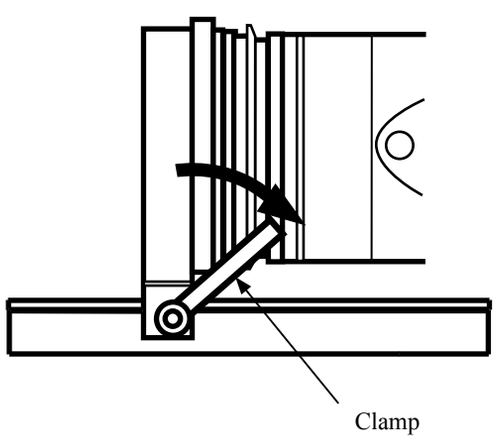
Notes: Keep the approx. 5-m distance from the laser beam window to the radiated surface.
Do not block the light path of the laser beam.

Procedure for mounting the lens

1. Mount the lens on the equipment and move the lens retainer stand in the direction of the arrow.

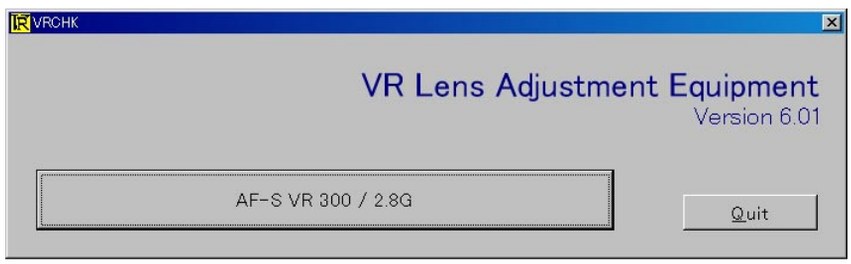


2. Move the lens retainer stand to the position as shown below and fix it by tightening the clamp.



④ Turn the VR lens adjustment equipment (J15380) ON and start the adjustment software.

⑤ Point the cursor to "AF-S VR 300/2.8G" on the Lens selection screen and click it.



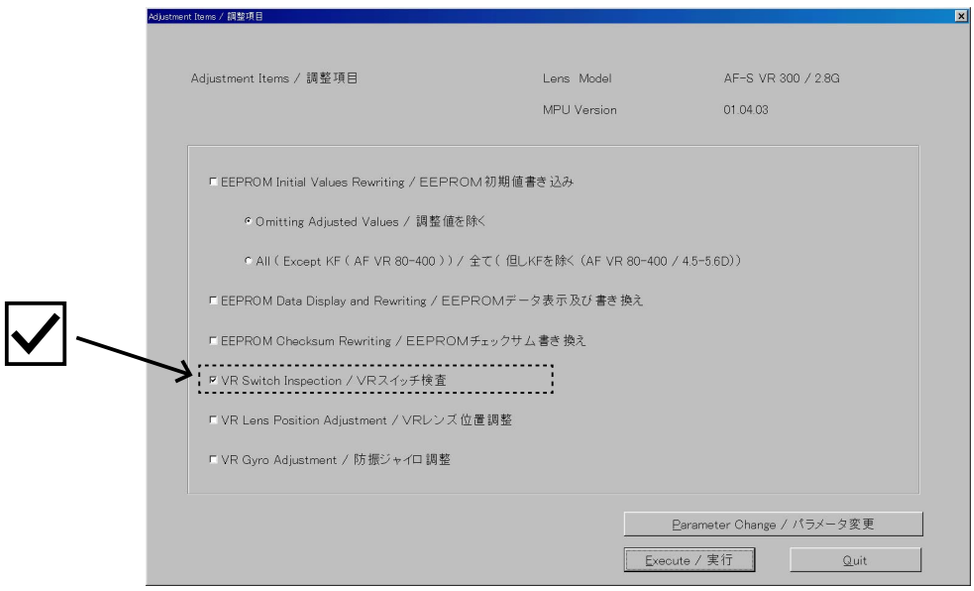
※ If the below message appears, reset the zoom ring by referring to "Procedure for mounting the lens" on the previous page. Then click "OK" button.
The focus ring is automatically set.

Note: Do not change the lens settings (zoom ring), until the adjustment is completed and go back to the Lens selection screen.
If the setting position changes during the adjustment, the correct adjustment value cannot be obtained.

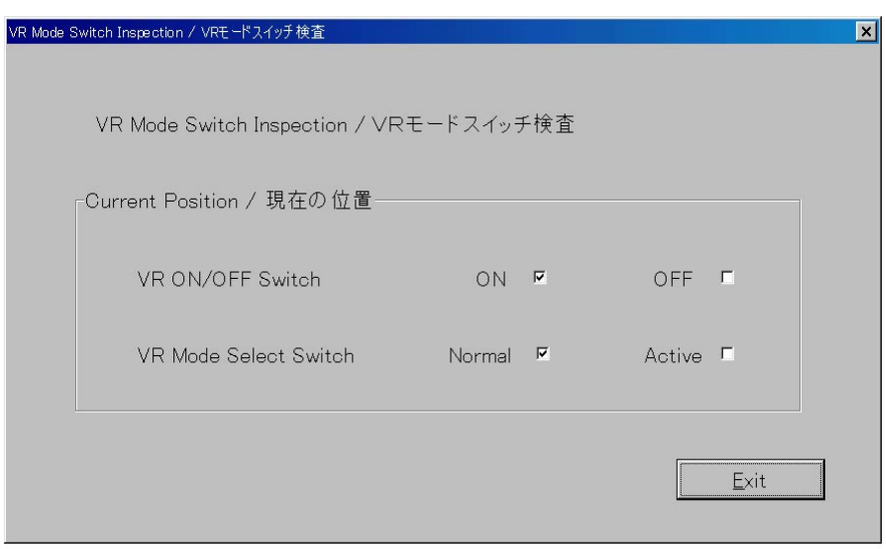
Vibration Reduction mode switch inspection

① Point the cursor to the check box before "VR Mode Switch Inspection" and click it.

② Point the cursor to the "Execute" button and click it.

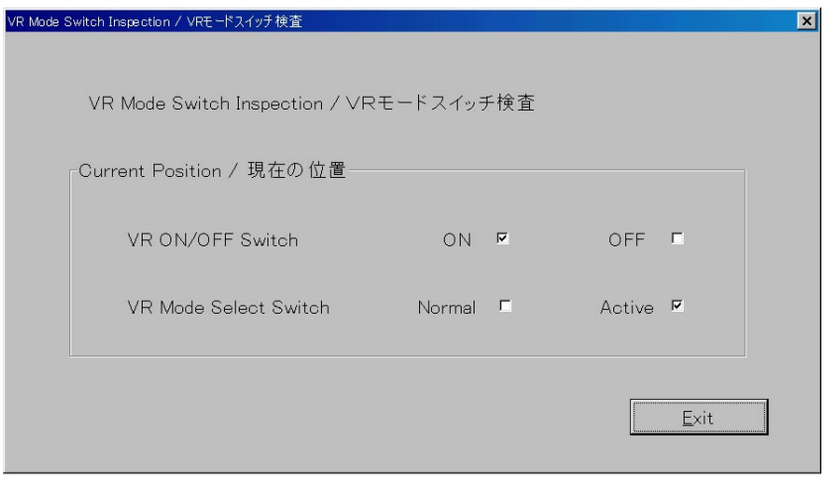

Adjustment Items / 調整項目
Adjustment Items / 調整項目
Lens Model
AF-S VR 300 / 2.8G
MPU Version
01.04.03
EEPROM Initial Values Rewriting / EEPROM初期値書き込み
Omitting Adjusted Values / 調整値を除く
All (Except KF (AF VR 80-400)) / 全て (但しKFを除く (AF VR 80-400 / 4.5-5.6D))
EEPROM Data Display and Rewriting / EEPROMデータ表示及び書き換え
EEPROM Checksum Rewriting / EEPROMチェックサム書き換え
VR Switch Inspection / VRスイッチ検査
VR Lens Position Adjustment / VRレンズ位置調整
VR Gyro Adjustment / 防振ジャイロ調整
Parameter Change / パラメータ変更
Execute / 実行
Quit

③ "VR Mode Switch Inspection" screen appears.



④ The position of VR mode switch is indicated.

Selecting the VR mode switch indicates the current position in the real time.



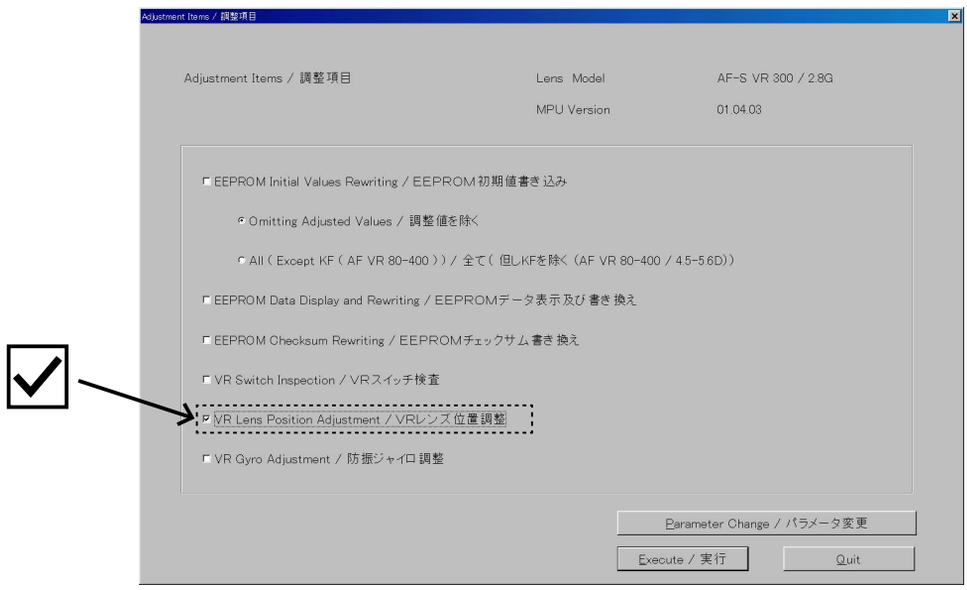
VR mode switch

⑤ When completing the VR mode switch inspection, point the cursor to "Exit" button and click it to exit the inspection screen.

VR lens position adjustment

① Point the cursor to the check box before "VR Lens Position Adjustment" and click it.

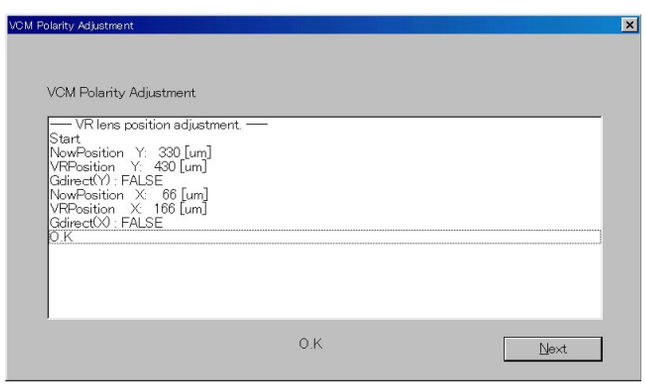
② Point the cursor to "Execute" button and click it.


Adjustment Items / 調整項目
Adjustment Items / 調整項目
Lens Model
AF-S VR 300 / 2.8G
MPU Version
01.04.03
EEPROM Initial Values Rewriting / EEPROM初期値書き込み
Omitting Adjusted Values / 調整値を除く
All (Except KF (AF VR 80-400)) / 全て(但しKFを除く (AF VR 80-400 / 4.5-5.6D))
EEPROM Data Display and Rewriting / EEPROMデータ表示及び書き換え
EEPROM Checksum Rewriting / EEPROMチェックサム書き換え
VR Switch Inspection / VRスイッチ検査
VR Lens Position Adjustment / VRレンズ位置調整
VR Gyro Adjustment / 防振ジャイロ調整
Parameter Change / パラメータ変更
Execute / 実行
Quit

③ The left message appears.
Turn the VR mode switch of the lens to ON, then point the cursor to "OK" button and click it.

・**VCM Polarity Adjustment (Automatic control)**

Get the polarity of the VCM (Voice Coil Motor) and write it in EEPROM as the compensation value.
During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees).
Therefore, set the lens to the position and click "OK" button.



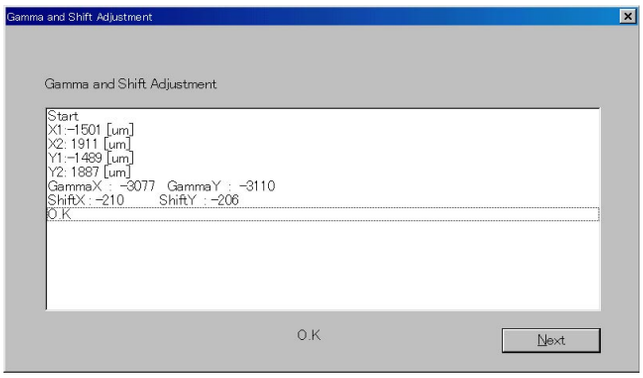
When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

・**Gamma and Shift Adjustment (Automatic control)**

Adjust the inclination and control center position based on the position sensor output of the VR unit.

During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees).

Therefore, set the lens to the position and click "OK" button.



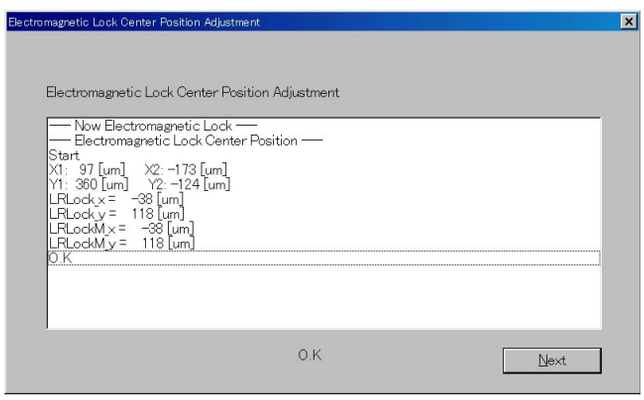
When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

・**Electromagnetic Lock Center Position Adjustment (Automatic control)**

Adjust the electromagnetic lock center position.

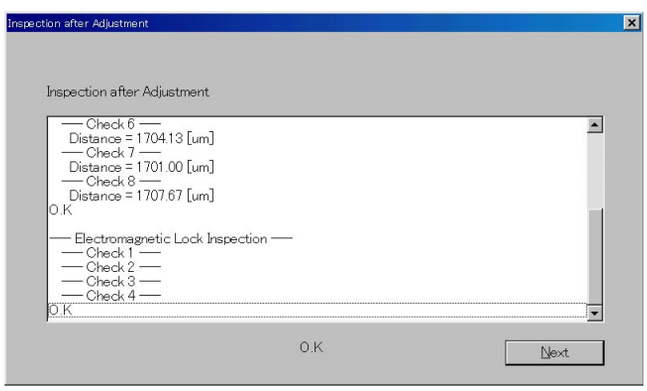
During the adjustment, the message appears to confirm the lens position of angle (0 or 90 degrees).

Therefore, set the lens to the position and click "OK" button.



When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

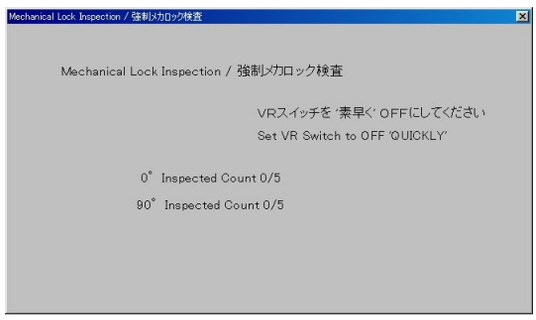
The inspection mode starts automatically. When the following is displayed on the execution screen, point the cursor to "Next" button and click it.



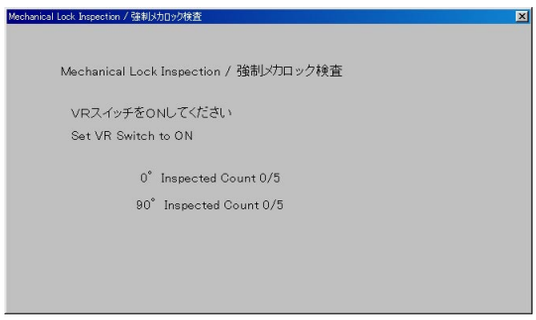
・Mechanical Lock Inspection

When the mechanical lock inspection is made, write the inspection result data as the adjustment value.

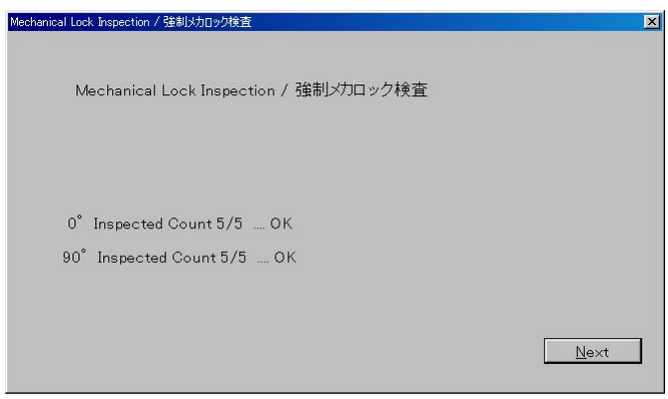
The below 1 and 2 screens are displayed alternately, so turn the VR switch to ON/OFF 5 times for the lens position 0 and 90 degrees respectively, according to the indicated instructions.


Mechanical Lock Inspection / 強制メカロック検査
Mechanical Lock Inspection / 強制メカロック検査
VRスイッチを '素早く' OFFにしてください
Set VR Switch to OFF 'QUICKLY'
0° Inspected Count 0/5
90° Inspected Count 0/5

Screen 1.


Mechanical Lock Inspection / 強制メカロック検査
Mechanical Lock Inspection / 強制メカロック検査
VRスイッチをONしてください
Set VR Switch to ON
0° Inspected Count 0/5
90° Inspected Count 0/5

Screen 2.


Mechanical Lock Inspection / 強制メカロック検査
Mechanical Lock Inspection / 強制メカロック検査
0° Inspected Count 5/5 .... OK
90° Inspected Count 5/5 .... OK
Next

When "OK" is shown on the execution screen, point the cursor to "Next" button and click it.

・When the message "Finished rewriting checksum value" is shown, click "OK" button.
Turn the VR switch to OFF according to the message, and click "OK" button to exit the adjustment screen.

Note:

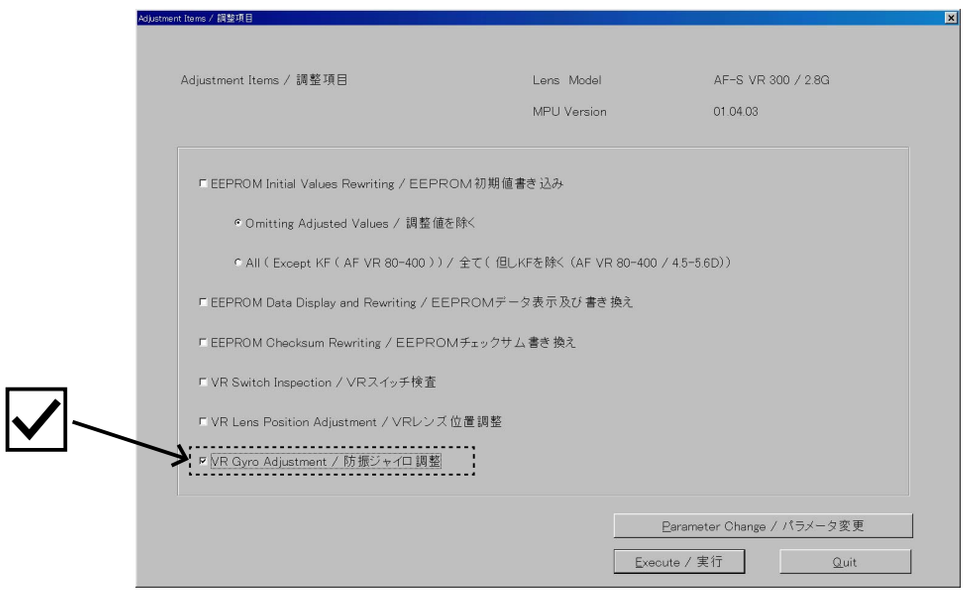
If "NG" is shown during the adjustment, click "Next" button to exit the inspection mode. Go back to the Lens Selection screen after rewriting the checksum value, and make the adjustment again.

If "NG" appears even after making the adjustment a few times, the VR unit, the gyro PCB, and the main FPC, etc should be defective.

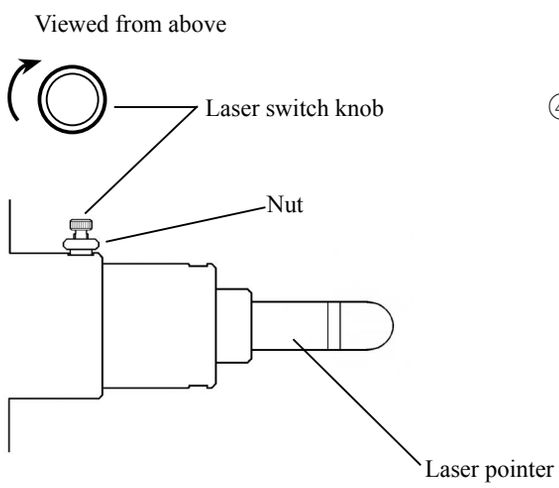
VR Gyro Adjustment

① Point the cursor to the check box before "VR Gyro Adjustment", and click it.

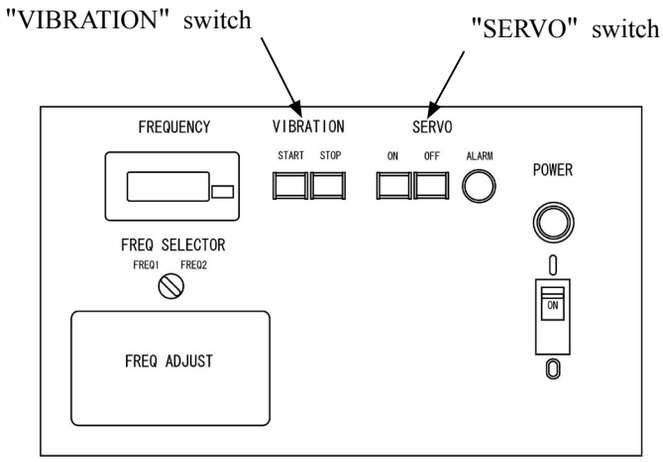
② Point the cursor to "Execute" button, and click it.


Adjustment Items / 調整項目
Adjustment Items / 調整項目
Lens Model
AF-S VR 300 / 2.8G
MPU Version
01.04.03
EEPROM Initial Values Rewriting / EEPROM初期値書き込み
Omitting Adjusted Values / 調整値を除く
All (Except KF (AF VR 80-400)) / 全て (但しKFを除く (AF VR 80-400 / 4.5-5.6D))
EEPROM Data Display and Rewriting / EEPROMデータ表示及び書き換え
EEPROM Checksum Rewriting / EEPROMチェックサム書き換え
VR Switch Inspection / VRスイッチ検査
VR Lens Position Adjustment / VRレンズ位置調整
VR Gyro Adjustment / 防振ジャイロ調整
Parameter Change / パラメータ変更
Execute / 実行
Quit

③ The left message appears.
Set "Frequency" of "Telephoto" to 5.0 Hz in the settings of the VR lens adjustment equipment (J15380).

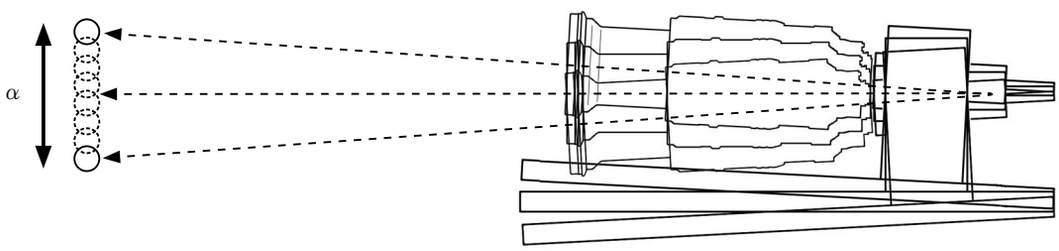


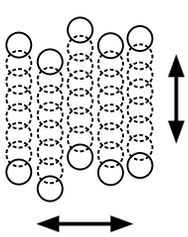
④ Loosen the laser switch nut of the VR lens adjustment equipment (J15380), and rotate the knob in the arrow direction to irradiate laser light.



⑤ Press "ON" button for "SERVO" switch and press "START" for "VIBRATION" switch of the VR lens adjustment equipment (J15380).

⑥ When the equipment starts to vibrate, measure the vibration width (α) of the laser beam.

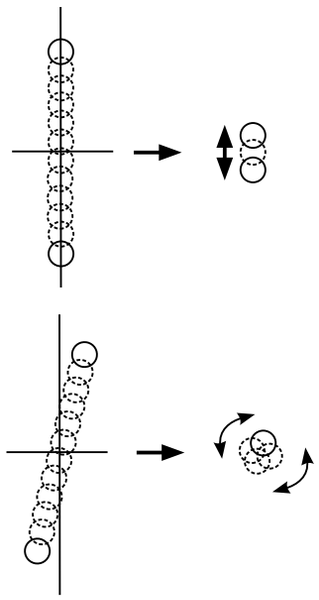




Notes : During the above measurement, a phenomenon occurs which causes laser spot light swinging from side to side and up and down.
This is the movement of the VR unit control and NOT defective.

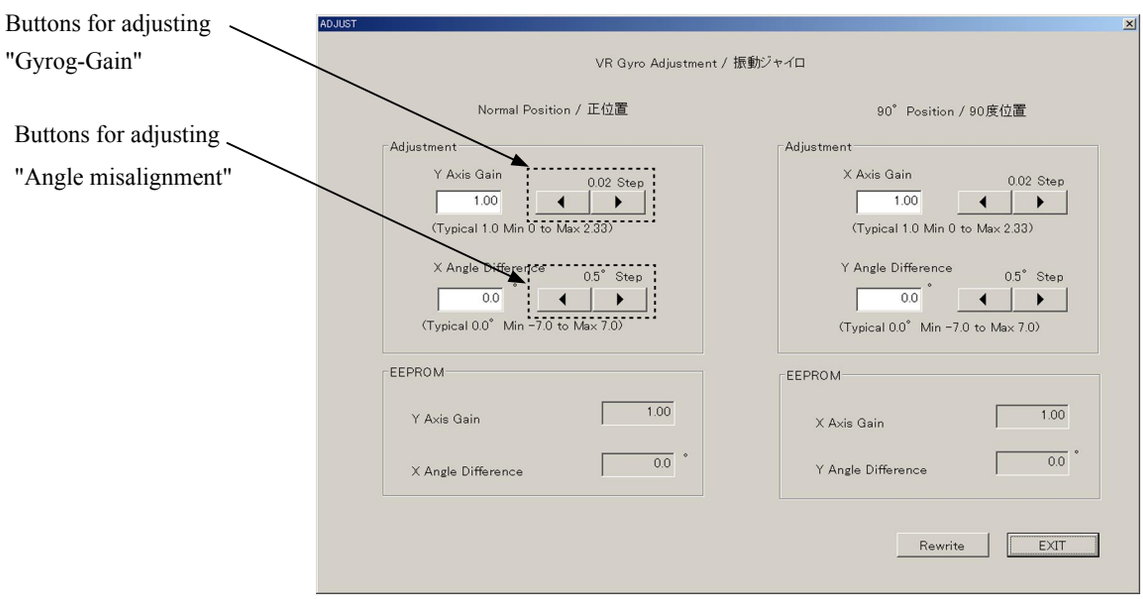
⑦ Point the cursor to "Next" button in the message box on the screen and click it. The vibration reduction function starts and the vibration width of the laser beam becomes narrow.

・Adjust misalignment of angle



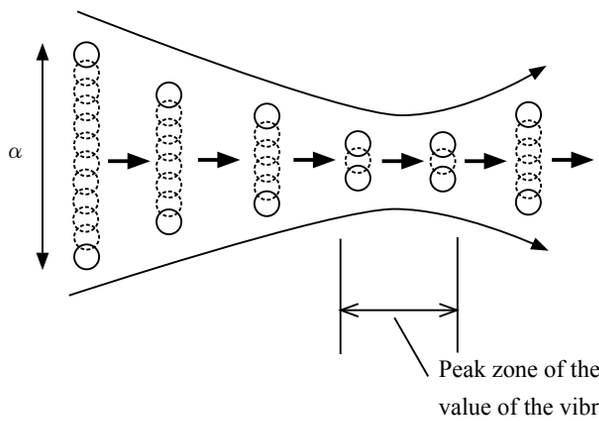
If the angle is misaligned, the laser beam source looks like turning around even after making the Gyro-gain adjustment.
If the angle misalignment is detected, adjust the misalignment by the adjustment buttons to correct it.

Note: After using the adjustment buttons, wait for a few seconds until the vibration movement stabilizes.



・Gyro-Gain Adjustment

Adjust the vibration width by the buttons for Gyro-gain adjustment so that the measured vibration width of the laser beam becomes 1/5 or less of the maximum width (α).

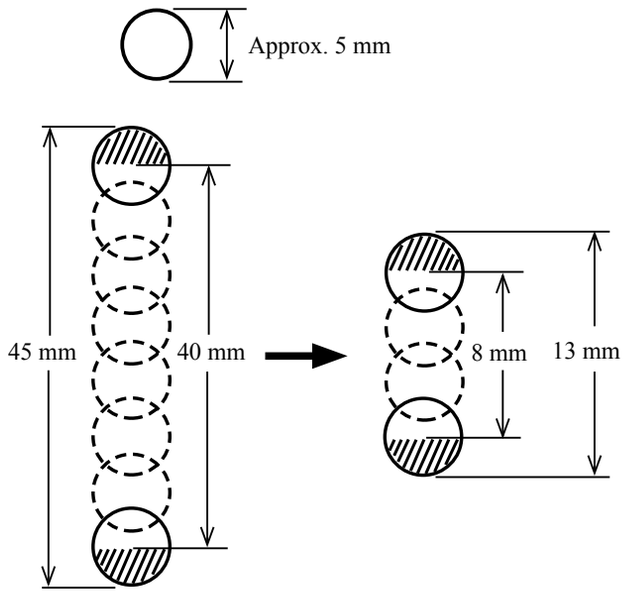


Standard:
Fifth part (1/5) or less of the vibration width (α)

Note: The laser beam vibrates widely again after passing the peak section of the minimum value.

《Ref.》

・The laser spot beam travels 5-m ahead, irradiating with spot of approx. 5 mm in diameter.



① The vibration width is adjusted at the center of the laser spot. First, measure the whole vibration width.

② Subtract the top and bottom radial parts (shaded areas) of the laser spots from the measured whole vibration width.

e.g.)

When the vibration width as a whole is "approx. 45 mm",
Vibration width of center is:
45 - (2.5 + 2.5) = 40 mm.

Standard figure after the gyro-gain adjustment
40 × 1/5 = 8 mm (Vibration width of center)
Vibration width as a whole is:
8+ (2.5+2.5) = 13 mm.

・How to obtain the minimum value of the vibration width

① Measure the vibration width while changing the adjustment value that is set every 0.02-Step as shown below.

② The peak zone of the minimum vibration width can be obtained by the actual measured value.

③ The center of the peak zone becomes the adjustment value.

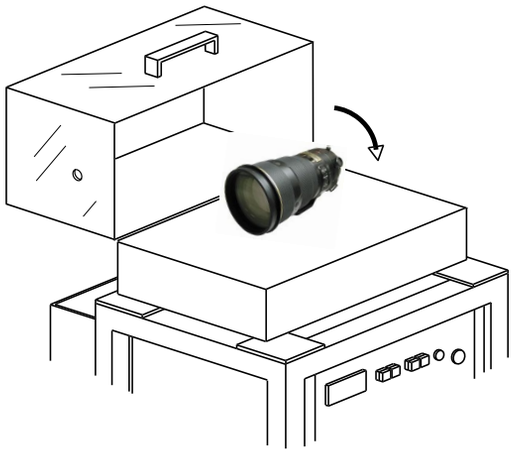
Gyro Gain Adjustment Value	Vibration width Actual measured value
・	・
・	・
0.90	15.5 mm
0.92	14.5 mm
0.94	14.0 mm
0.96	13.5 mm
0.98	13.0 mm
1.00	13.0 mm
1.02	13.0 mm
1.04	13.5 mm
1.06	14.0 mm
1.08	14.5 mm
1.10	15.0 mm
・	・
・	・

Note: Measure the vibration width in the half a millimeter (0.5 mm).

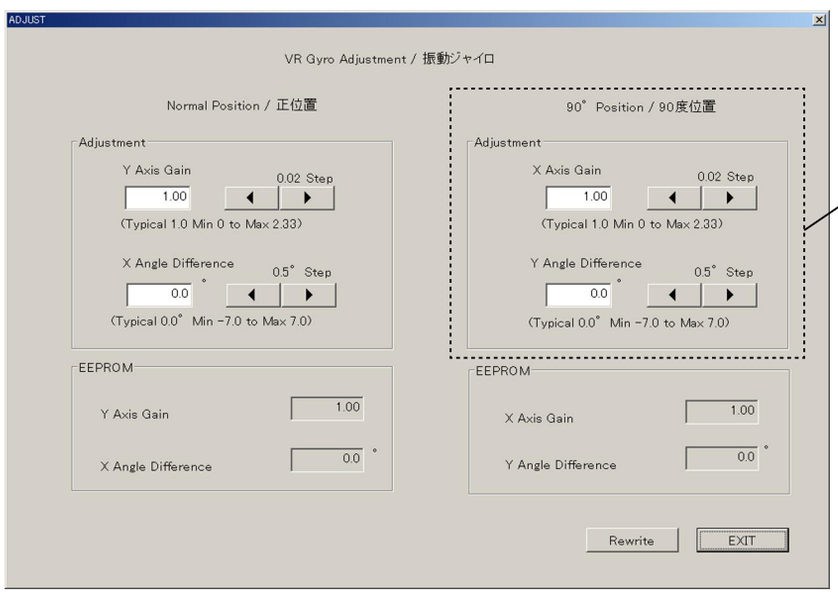
・ Press "STOP" button of VIBRATION switch of the VR adjustment equipment to stop vibrations.

・ Rotate the lens through 90° in the direction indicated by the arrow, then press “START” button of VIBRATION switch to start vibrations.

・ At the 90° position, adjust the angle misalignment and make gyro-gain adjustment.



Note: When adjusting the lens at the 90 ° position, adjust by the buttons for the adjustment at 90 ° position as shown below.



Buttons for adjustment at 90 ° position

・After the adjustment, click "Rewrite" button to write the adjustment value in EEPROM in the lens.

・Then, click "EXIT" button to exit the adjustment mode.

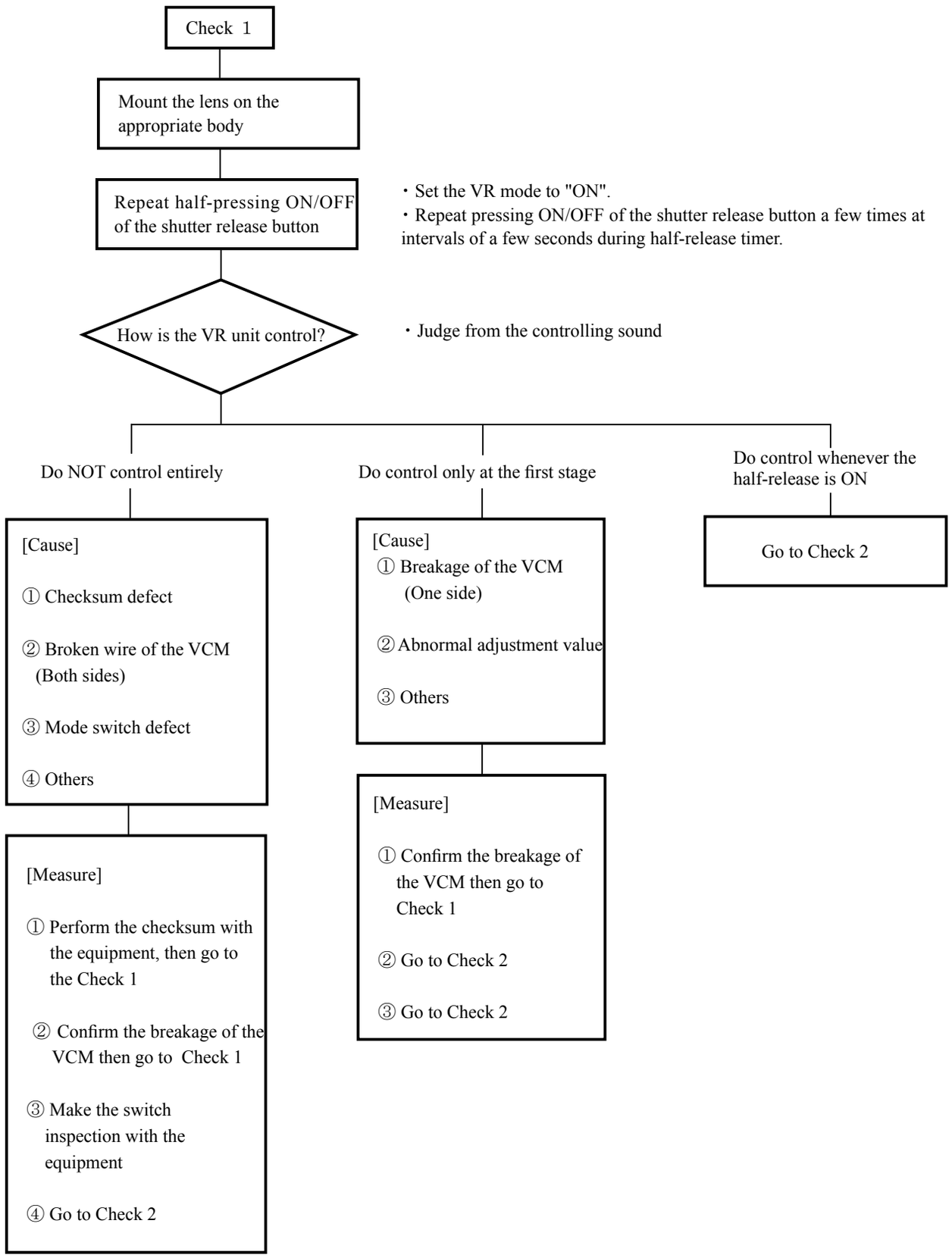
Note: If clicking "EXIT" button without clicking "Rewrite" button, the adjustment value is not recorded and the adjustment details are not written.

・Click "Quit" button on the adjustment items screen to go back to the Lens selection screen.

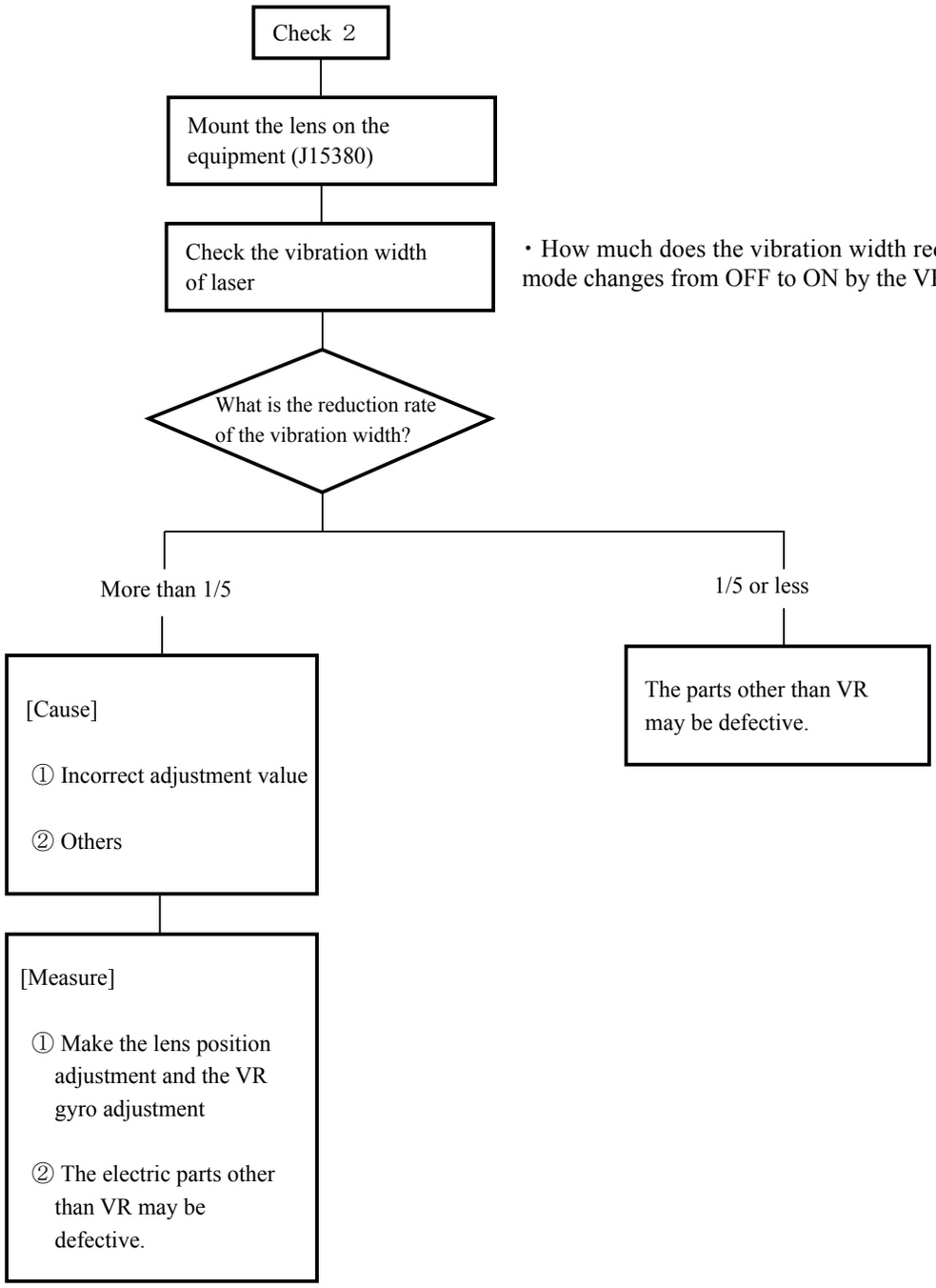
Note： Do NOT remove the lens or turn OFF the VR lens adjustment equipment until going back to the Lens selection screen. Otherwise, troubles may occur such as incorrect recording of the adjustment value due to blocked communications, etc..

Criteria for VR performance

Before making the VR adjustment of defective products by using the equipment, refer to the following.

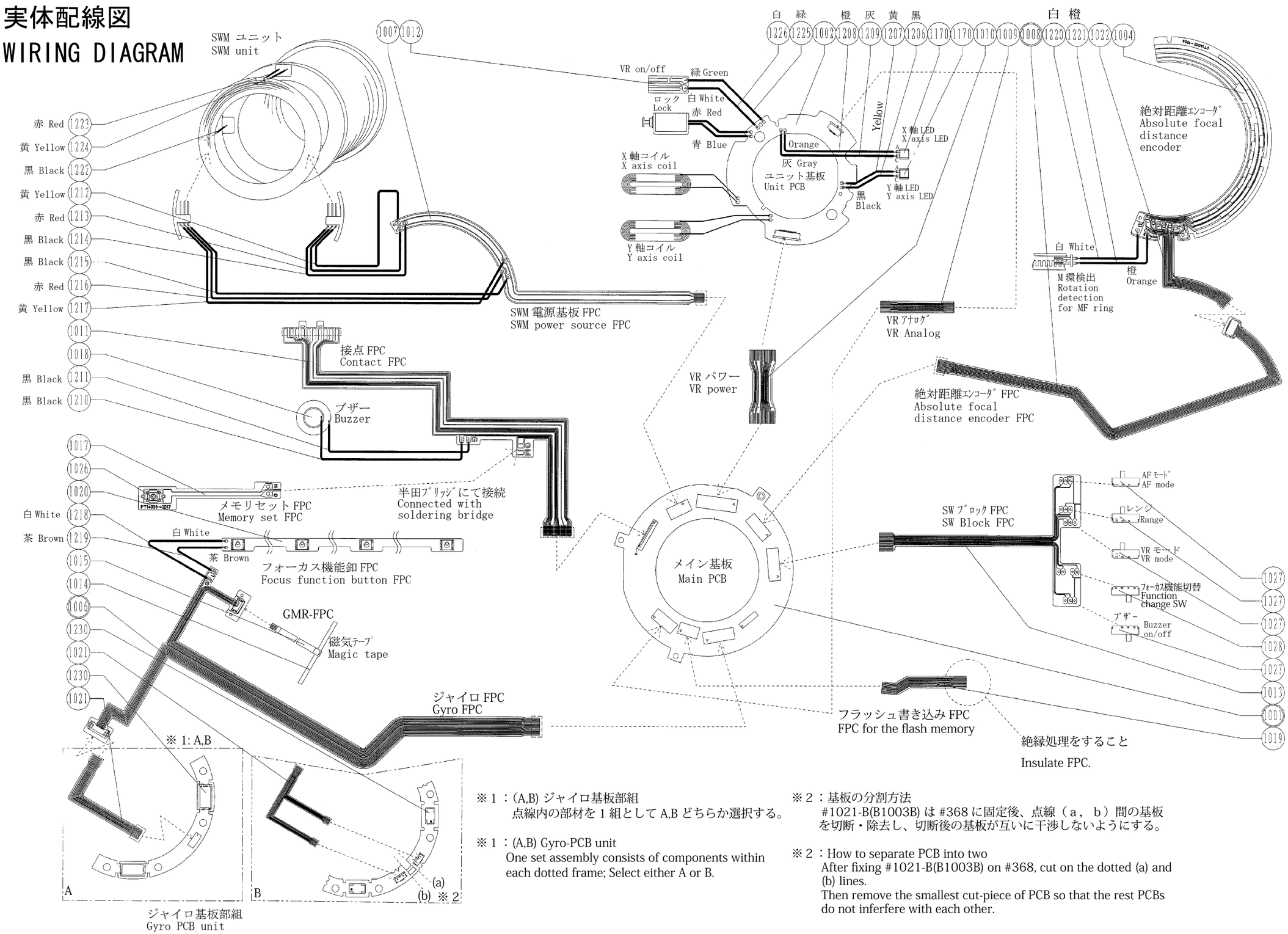

Check 1
Mount the lens on the appropriate body
Repeat half-pressing ON/OFF of the shutter release button
・Set the VR mode to "ON".
・Repeat pressing ON/OFF of the shutter release button a few times at intervals of a few seconds during half-release timer.
How is the VR unit control?
・Judge from the controlling sound
Do NOT control entirely
Do control only at the first stage
Do control whenever the half-release is ON
[Cause]
① Checksum defect
② Broken wire of the VCM (Both sides)
③ Mode switch defect
④ Others
[Measure]
① Perform the checksum with the equipment, then go to the Check 1
② Confirm the breakage of the VCM then go to Check 1
③ Make the switch inspection with the equipment
④ Go to Check 2
[Cause]
① Breakage of the VCM (One side)
② Abnormal adjustment value
③ Others
[Measure]
① Confirm the breakage of the VCM then go to Check 1
② Go to Check 2
③ Go to Check 2
Go to Check 2

Go on the next page "Check 2"


Check 2
Mount the lens on the equipment (J15380)
Check the vibration width of laser
What is the reduction rate of the vibration width?
More than 1/5
1/5 or less
[Cause]
① Incorrect adjustment value
② Others
[Measure]
① Make the lens position adjustment and the VR gyro adjustment
② The electric parts other than VR may be defective.
The parts other than VR may be defective.

・How much does the vibration width reduce, when the VR mode changes from OFF to ON by the VR-gyro adjustment.

実体配線図
WIRING DIAGRAM



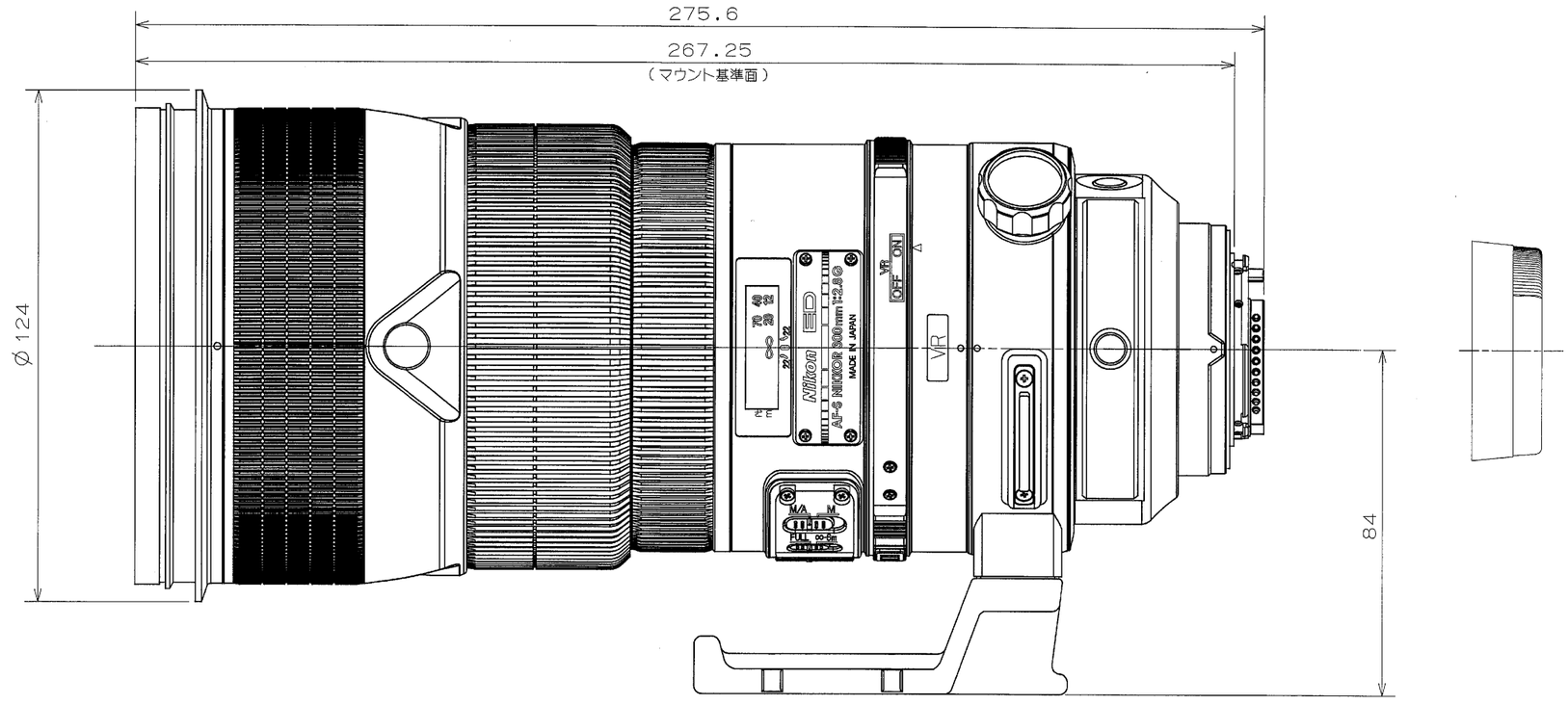
※1：(A,B) ジャイロ基板部組
点線内の部材を 1 組として A,B どちらか選択する。

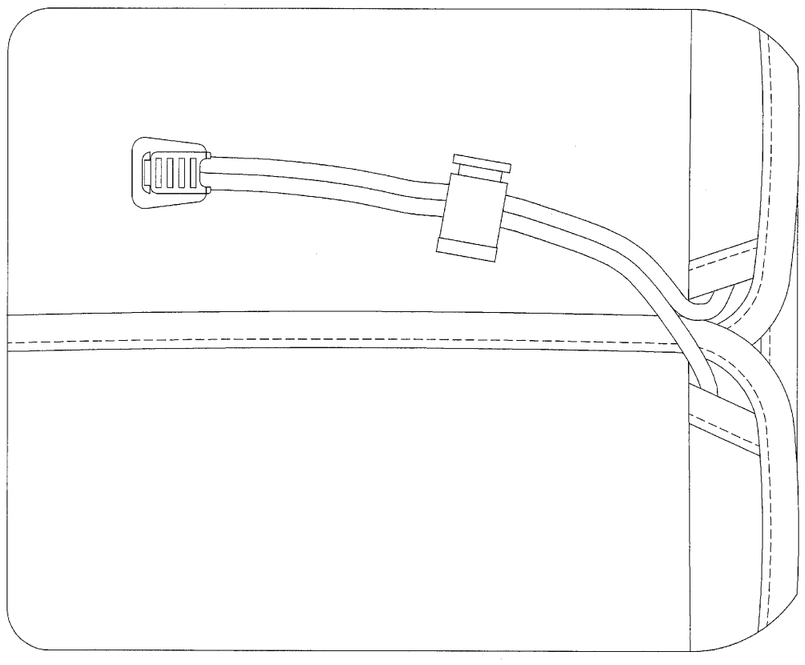
※1：(A,B) Gyro-PCB unit
One set assembly consists of components within each dotted frame; Select either A or B.

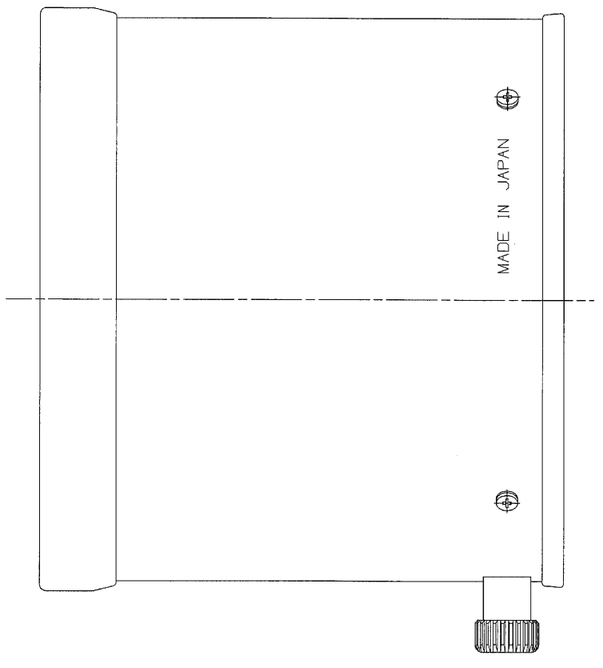
※2：基板の分割方法
#1021-B(B1003B) は #368 に固定後、点線（a，b）間の基板を切断・除去し、切断後の基板が互いに干渉しないようにする。

※2：How to separate PCB into two
After fixing #1021-B(B1003B) on #368, cut on the dotted (a) and (b) lines.
Then remove the smallest cut-piece of PCB so that the rest PCBs do not inferfere with each other.

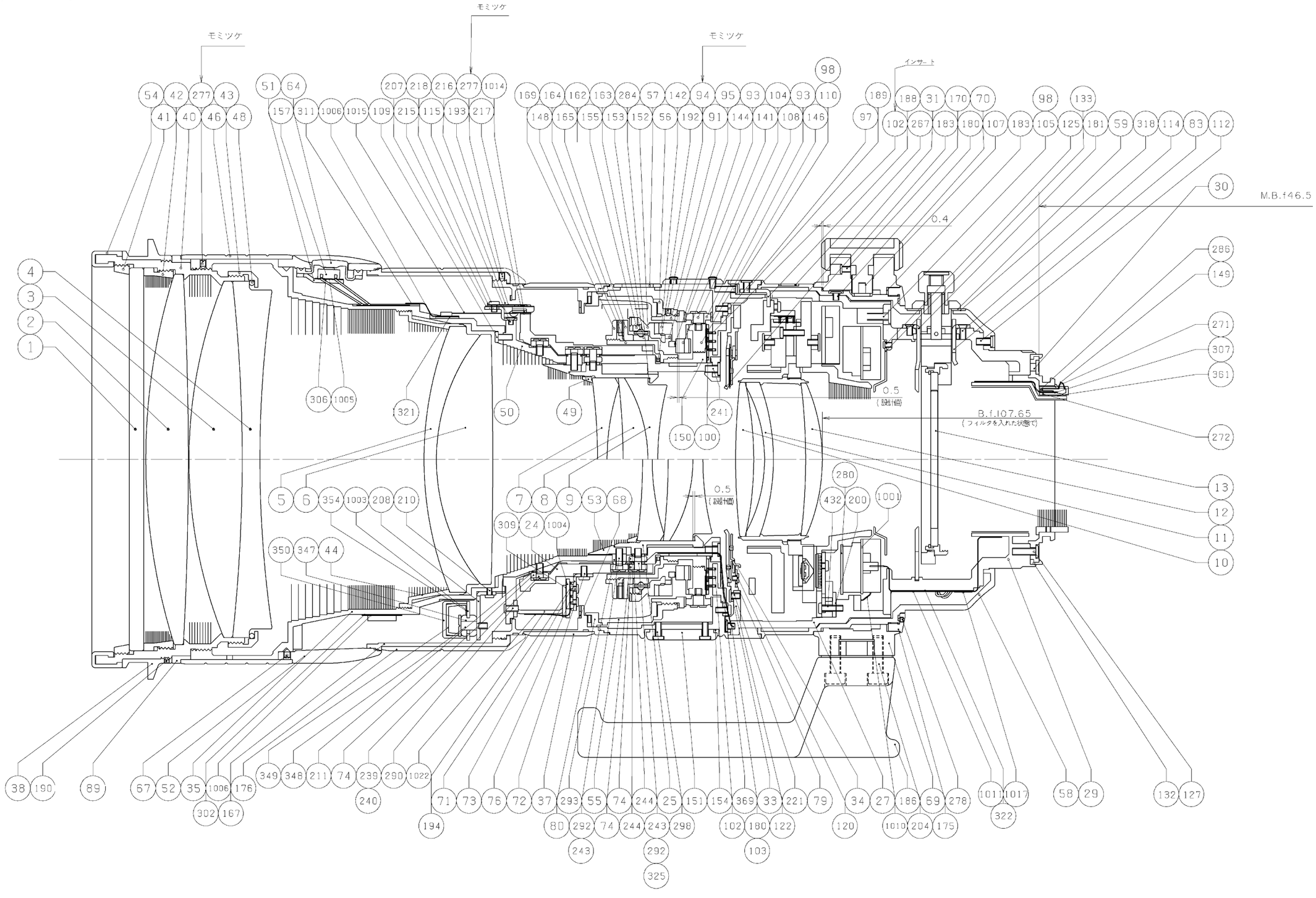
外観図 Sketch drawings

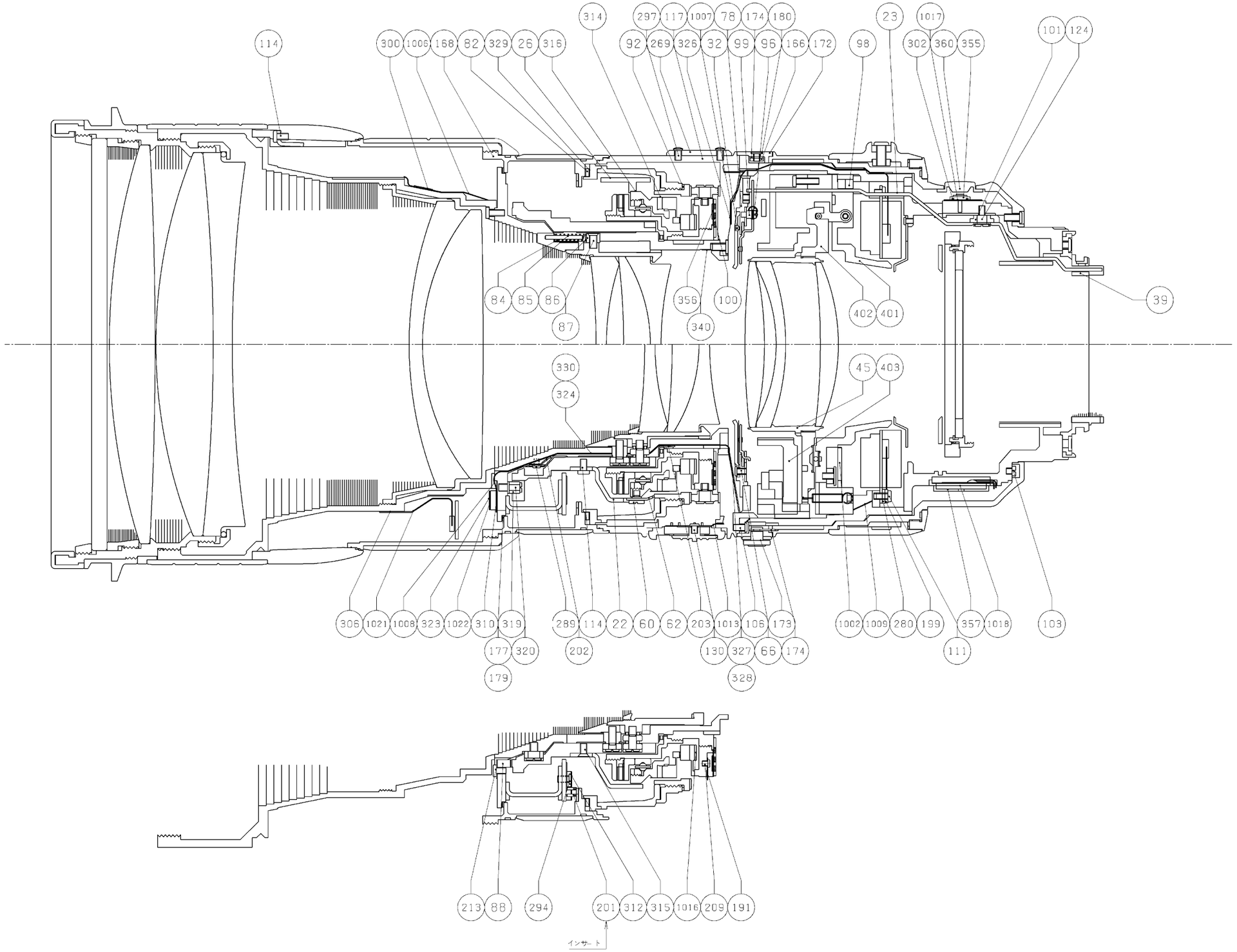






組立図 Structure of the Lens

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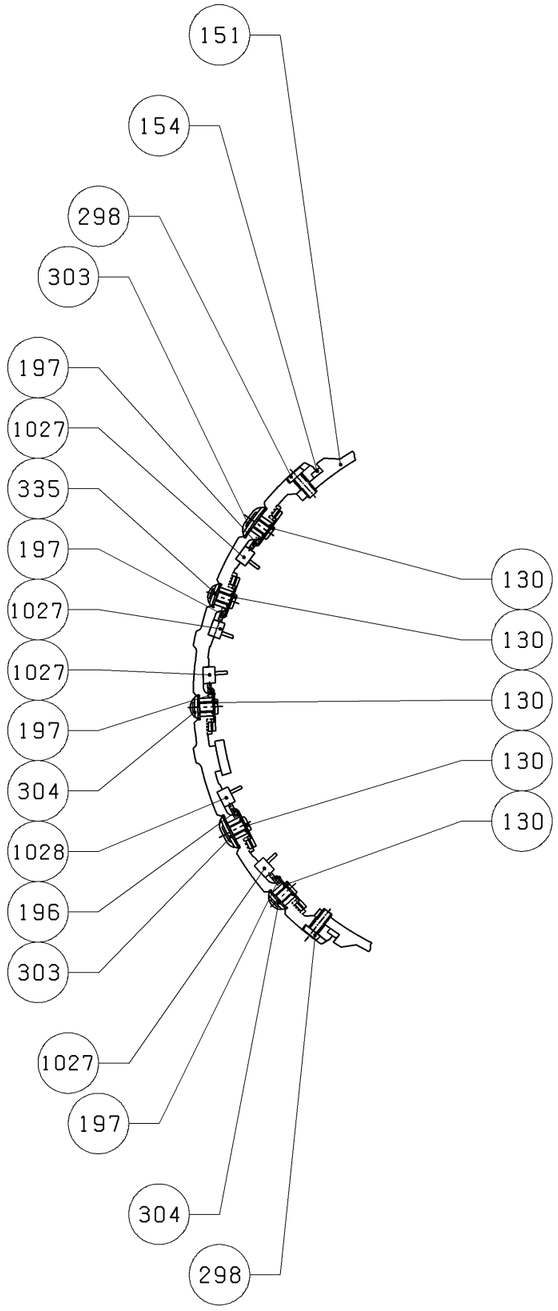
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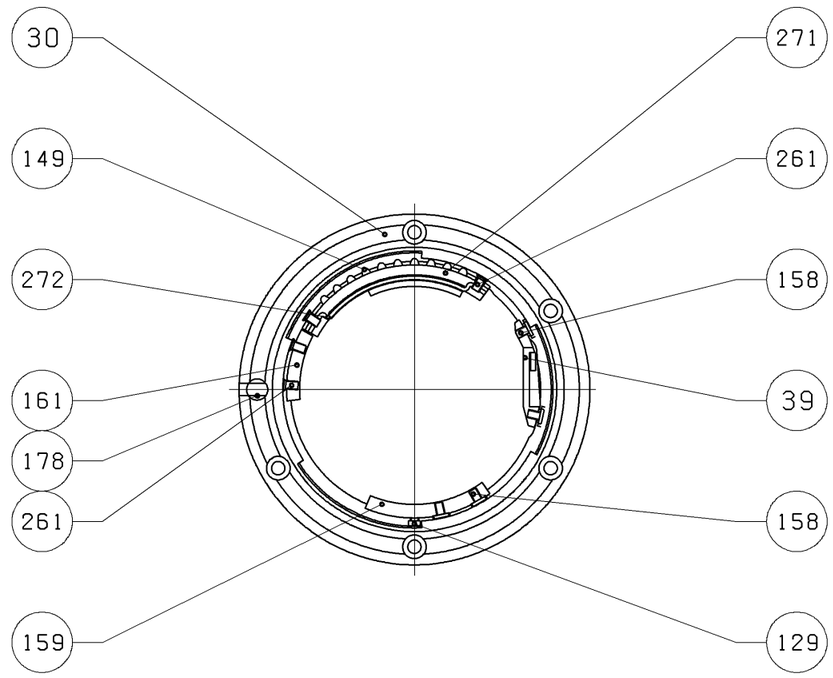
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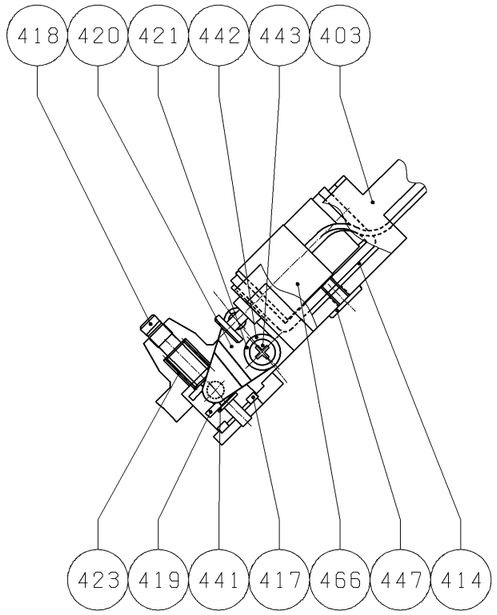
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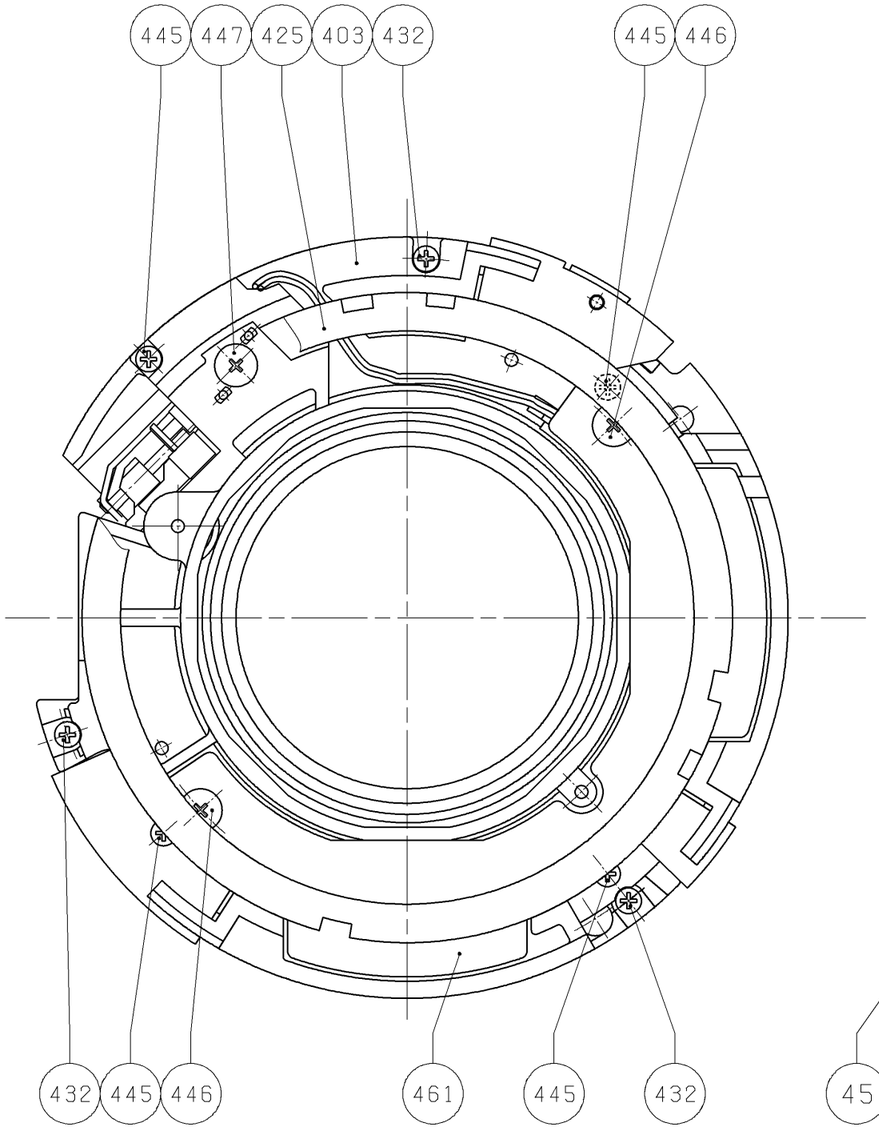
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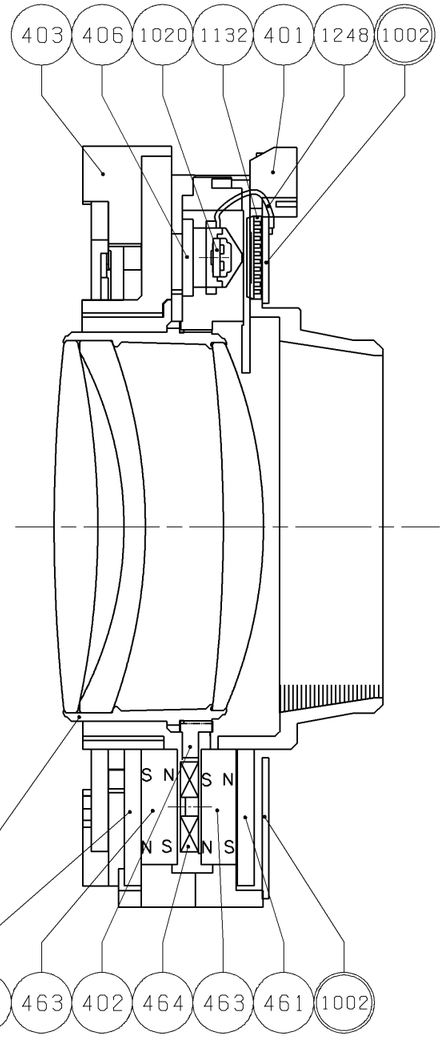
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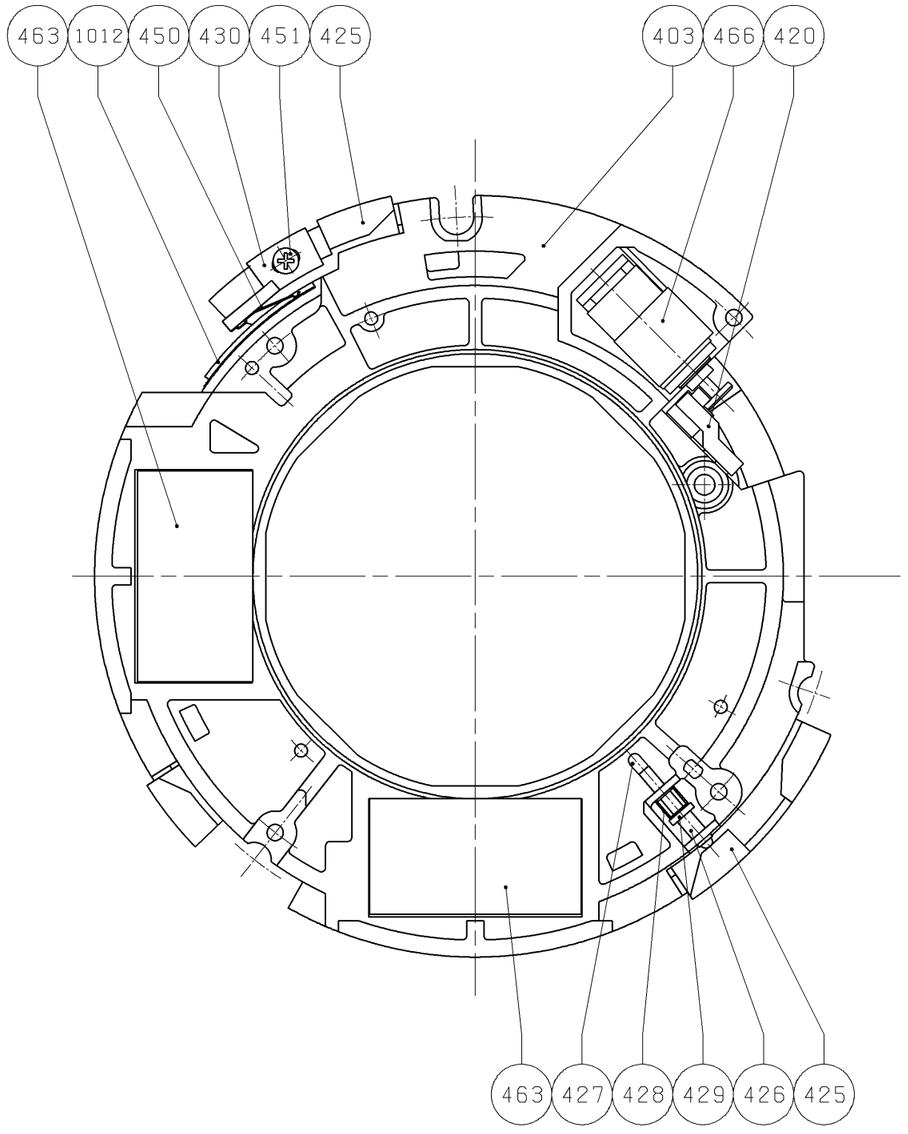
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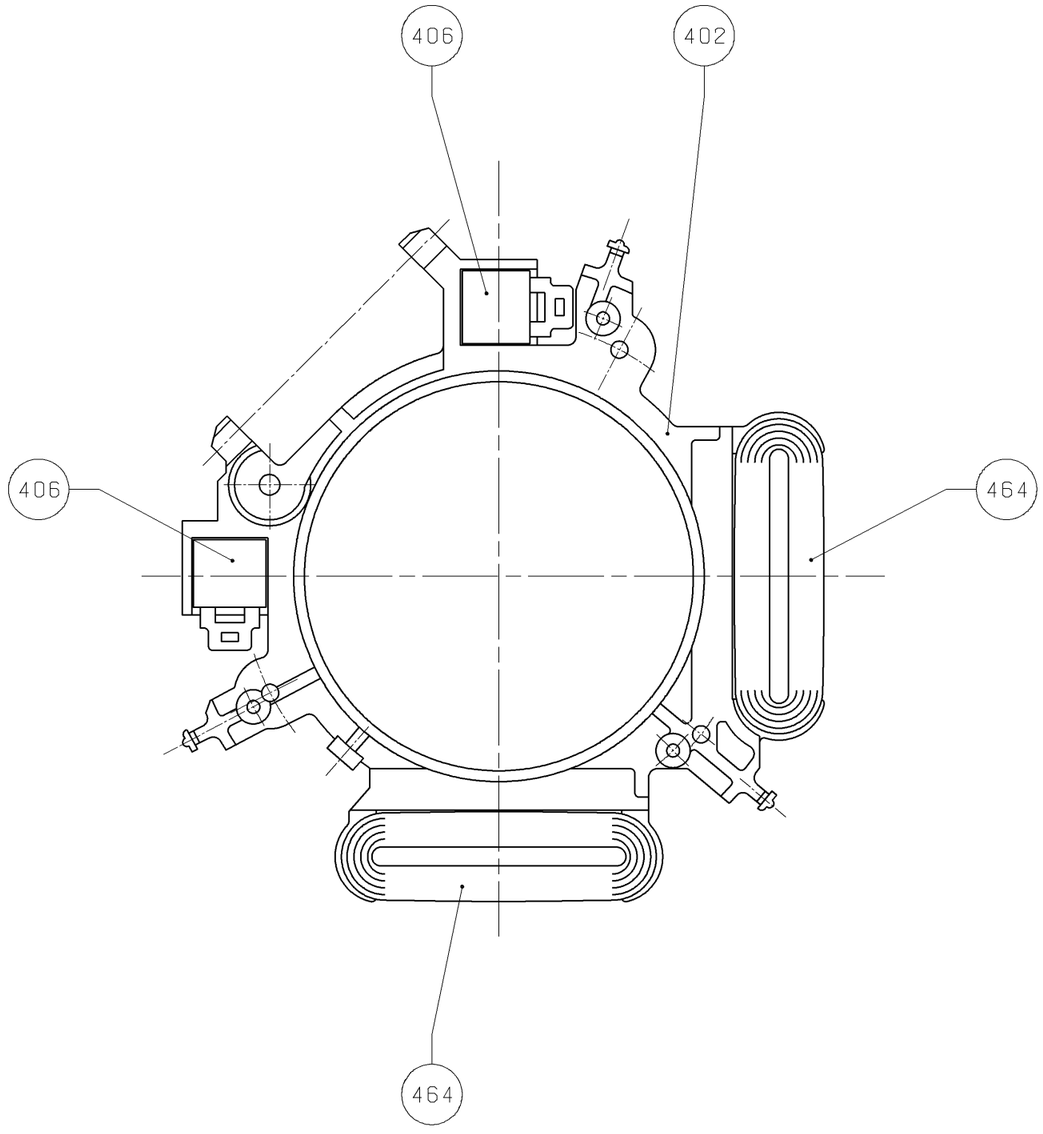
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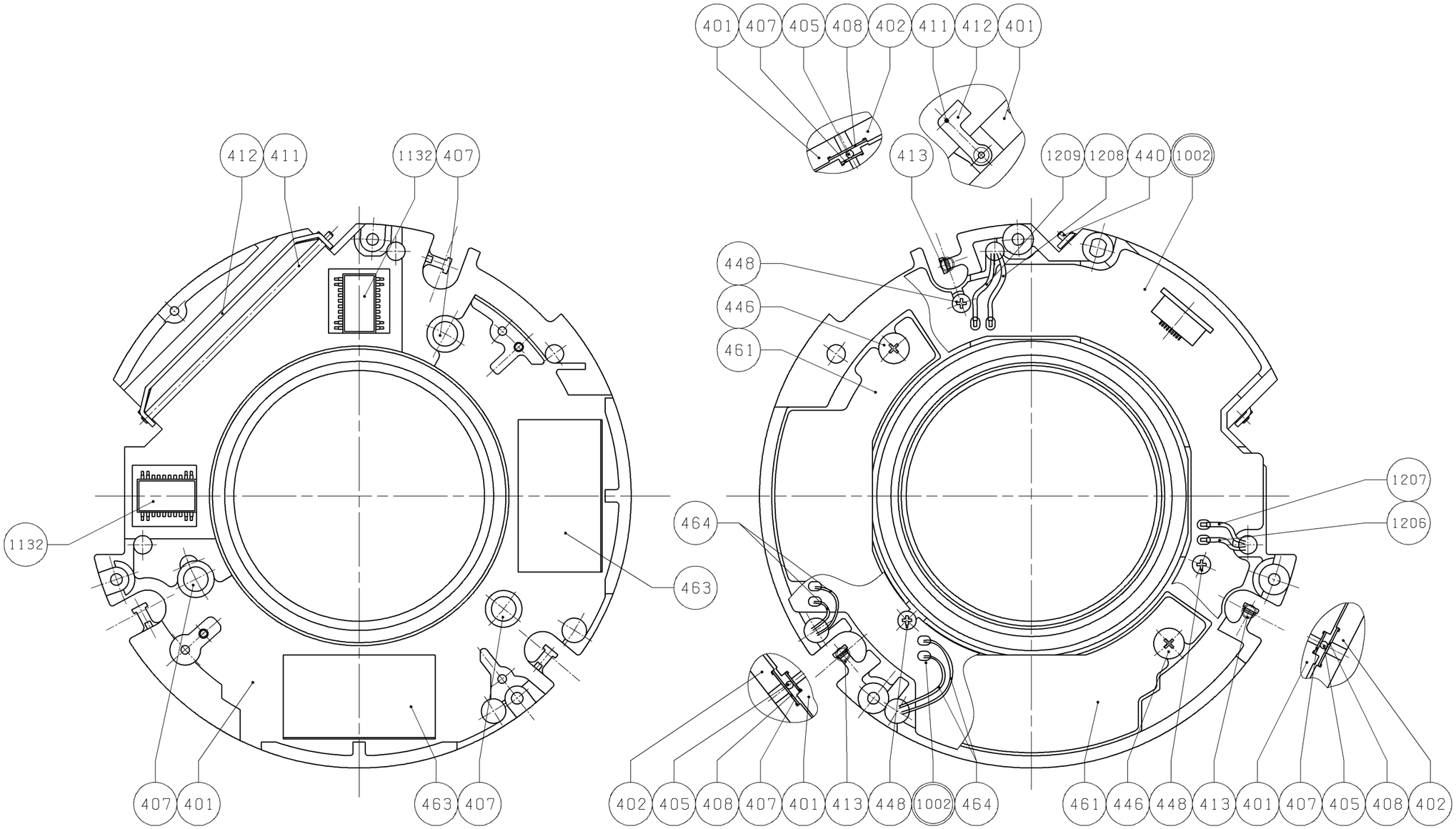
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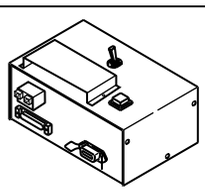
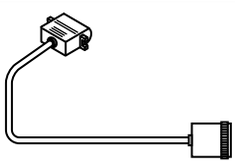
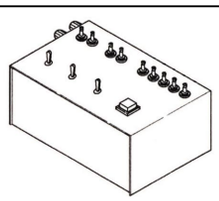
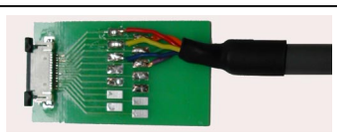
工具編 TOOLS

★：NEW TOOL

RJ 番号 RJ No.	名称 NAME OF TOOL	備考 OTHERS
J19002	縦型焦点面検査器　ＬＴ－５００Ｓ BACK FOCUS COLLIMATER LT-500S	
J9001-5N	安定化電源５Ａ DC REGULATED POWER SUPPLY 5A	
J18028	Ｆ用レンズ受け台 LENS ADAPTER FOR FOCUS TESTER	
★ J18378	AF-S 300 VR 点検・調整ソフト ADJ.FD FOR AF-S 300VR (IBM 3.5)	
★ J18380	VR 調整ｿﾌﾄ (AF-S 300VR)　FD IBM3.5 VR ADJ.FD FOR AF-S 300VR (IBM3.5)	
J15306-1 	ＡＦ－Ｉ通信ボックス AF-I LENS COMMUNICATION BOX(CE)	
J15307 	ＡＦ－Ｉ通信アダプター COMMUNICATION ADAPTER FOR AF-I	
J15355 	スイッチ工具 SW BOX TOOL	
★ J15416 	通信工具 4 PIN COMUNICATION TOOL	
工具設定なし RJNo.is not available	パーソナルコンピュータ PERSONAL COMPUTER	
工具設定なし RJNo.is not available	オシロスコープ OSCILLOSCOP	
J15380	ＶＲレンズ調整装置 INSPECTION TOOL FOR VR LENS	

★：NEW TOOL

	RJ 番号 RJ No.	名称 NAME OF TOOL	備考 OTHERS
	J11288	AF-S 300/2.8 D Ⅱ 2群回螺器 WRENCH FOR 2G AF-S 300/2.8 D2	AF-S300/2.8 D Ⅱ 2群と共通
	J11290	AF-S 300/2.8 D Ⅱ 3群回螺器 WRENCH FOR 3G AF-S 300/2.8 D2	AF-S300/2.8 D Ⅱ 3群と共通
★	J11314	AF-S VR 300/2.8G 3群回螺器 WRENCH FOR 3G AF-S VR 300/2.8G	
★	J11313	VRユニット固定工具 VR FIX TOOL FOR 3G AF-S VR 300/2.8G	
	OS-30MF	ドライサーフ ＯＳ－３０ＭＦ DRY SERF OS-30MF(OIL BARRIER)	
	I-40	ＡＦレンズ用グリース（Ｉ－４０） GREASE FOR AF LENS	
	EDB0011	ネジ゛ロック（赤）1401C SCREW LOCK 1401C	
	C-8008B	セメダイン ８００８（黒） CEMEDINE 8008(BLACK)	
	GE-8	ＡＦレンズ用グリースＧＥ８ GREASE FOR AF LENS GE-8	
	EBB8041	スクアグリースＧ７８１３ GREASE (G7813)	
	L-241	ロックタイト＃２４１（青） LOCTITE #241	
	EDZ4113	ボンド Ｇ１０３ BOND G103	
	F-890	ドライルーブ Ｆ－８９０ DRILUBE F-890	
	G92KA	フロイル Ｇ９２ＫＡ FLOIL (G92KA)	